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# WHY YOU SHOULD CONSTRUCT

Constructive geometry and the Pythagorean Quadrivium

By Pierre Beaudry, 3/18/18

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*“Believe nothing that for which you cannot give yourself a constructive proof.”*

Lyndon LaRouche

## INTRODUCTION

*“To the man who pursues his studies in the proper way, all geometric constructions, all systems of numbers, all duly constituted melodic progression, the single ordered scheme of all celestial revolutions, should disclose themselves, and disclose themselves they will, if, as I say, a man pursues his studies aright with his mind’s eye fixed on their single end. As such a man reflects, he will receive the revelation of a single bond of natural interconnection between all these problems. If such matters are handled in any other spirit, a man, as I am saying, will need to invoke his luck. We may rest assured that without these qualifications the happy will not make their appearance in any society; this is the method, this is the pabulum, these are the studies demanded; hard or easy, this is the road we must tread.”* (Plato, *Epinomis*, 992, ab.)

At the end of Plato's *Epinomis*, the Athenian (Socrates) is following the transfinite pathway to the truth when he recommends the mastery of the interconnectedness of the Pythagorean Quadrivium; that is, the unity of thought which links Arithmetic, Geometry, Music, and Astronomy and which increases the energy-flux density of your mind through constructive geometry. The reason it is so is because this is the only method that will make man happy. So, the purpose of this report is to make you happy by showing you that the mastery of such a new form of Quadrivium which can be achieved by constructive geometry.

## **1. HOW PYTHAGORAS CONSTRUCTED THE KNOWLEDGE OF THE HUMAN SOUL BY MEANS OF THE TETRAD<sup>1</sup>**

The most difficult aspect of the Pythagorean method of constructive geometry is in the understanding of the primacy of the creative process of the soul over the physical universe; that is to say, in understanding how the soul is constructed for the purpose of generating all things.

This is also, perhaps, the most difficult aspect of Plato's doctrine, and possibly the most controversial, because sense perception always tells you otherwise. In the *Timaeus*, Plato stated that the method for constructing the soul was in accordance with a triply-folding principle of double mean proportionality, the Arithmetical and the Geometrical. I recall here the crucial piece where Plato identified how God created the "*soul of the world*":

*"Midway between the Being which is indivisible and remains always the same and the Being which is transient and divisible in bodies, He blended a third form of Being compounded out of the twain, that is to say, out of the Same and the Other; and in like manner He compounded it midway between that one of them which is indivisible and that one which is divisible in bodies. And He took the three of them, and blended them all*

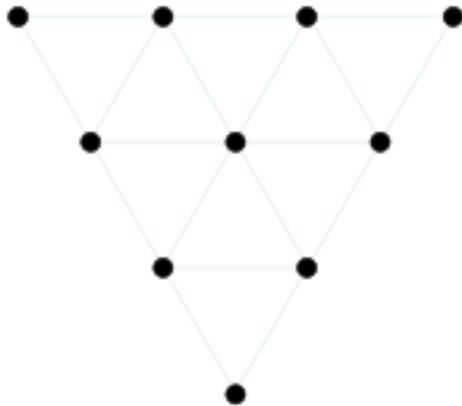
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<sup>1</sup> I emphasize that the reader must take the time and effort to do the following constructions.

*together into one form, by forcing the Other into union with the Same, in spite of its being naturally difficult to mix. And when with the aid of Being He had mixed them, and had made of them one out of three, straightway He began to distribute the whole thereof into so many portions as was meet; and each portion was a mixture of the Same, of the Other, and of Being."*<sup>2</sup>

Thus, the “*soul of the world*” has been generated with a triply-connected form of action relating the *Same* with its opposite, the *Other*, and, by uniting such opposites to generate *Being*. That is the process by means of which a third is generated from the other two, as Christians were prompted to understand with the process of the Holy Trinity. That is the principle of geometrical construction that we are now going to adopt for constructing an elementary understanding of what I recommend to be a modified form of the Quadrivium of knowledge: Music, Astrogeometry, Arithmetic, and Theology (MAAT).

The point to understand, here, is that no matter what the conflicts may arise from the confrontation between the *Same* and the *Other*, the axioms of the former



state of existence will no longer prevent the coming into *Being* of the next step of composition which is to come from the future, and through which the former state will be superseded and transformed into a higher level of existence. In this entire process of discovering, the alphestes is always expected to ask: *where will the next step be?* Take the case of the Pythagorean Tetrad as being such an epistemological construct.

**Figure 1** the Pythagorean Tetrad.

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<sup>2</sup> Plato, *Timaeus*, (35a-b), Plato in Twelve Volumes, Vol. 9 translated by W.R.M. Lamb. Cambridge, MA, Harvard University Press; London, William Heinemann Ltd. 1925

Initially, the Pythagorean Tetrad (*τετρακτύς*) represents the combination of a quadratic unity, as in the unity of the four first numbers  $1+2+3+4 = 10$  generate the decade. The geometrical equivalent of this Tetrad is represented by the single point, the two point line, the three point surface triangle, and the four point solid tetrahedron. The musical application includes the four harmonic ratios of the Fourth 4:3, the Fifth 3:2, the Octave 2:1, and the Double Octave 4:1. In turn, this power of two *ordering in position* also corresponded to the orbs of the eight planets of the Solar System known during ancient times. Thus, more generally, the Pythagorean Tetrad represented the four domains of knowledge: Arithmetic, Geometry, Music, and Astronomy as the epistemological unity of harmonic partitioning of the human mind. For the Pythagoreans, as for Plato, the Tetrad also represented analogically the four elements of physical nature, fire, air, water, and earth as they became reflected in the Platonic solids.

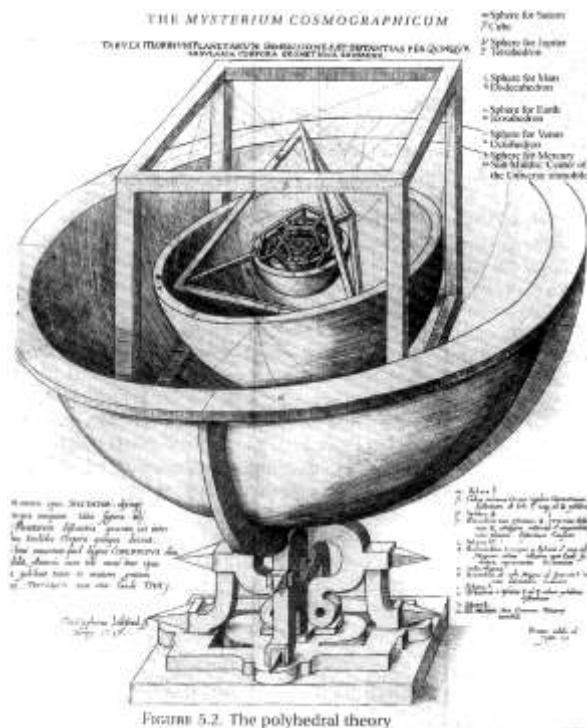


FIGURE 5.2. The polyhedral theory

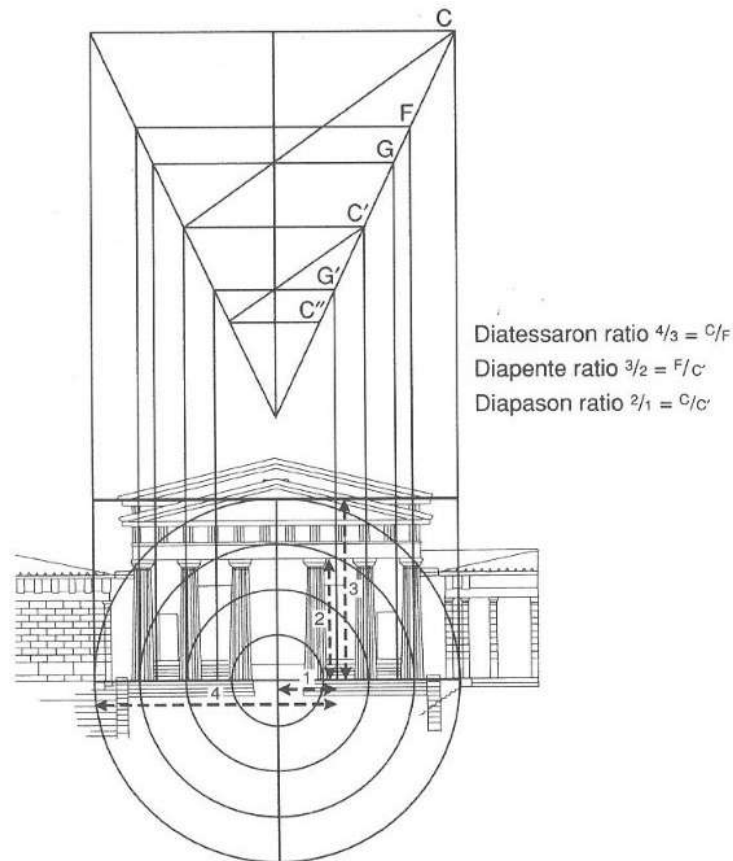
**Figure 2** Kepler's geometric construction of the Solar System based on the harmonics of the Five Platonic Solids inscribed into Spheres.

It is generally acknowledged that the Pythagorean Tetrad is the basis for the Quadrivium, however, no two historians have yet to agree on any of the multiple

<sup>3</sup> See the Schiller Institute Manuel on Tuning and Registration, Washington DC, 1992.

meaning and purpose of the term Tetrads; therefore, the condition that I am going to give to it, in the spirit of Leibniz, Plato, and Pythagoras, is that for any part of the Tetrads to be validated, or for any other knowledge whatsoever, it is first required to be constructed geometrically. The exercise is more than simple imaginary analogy.

## 2. HOW TO CONSTRUCT THE UNDERLYING GEOMETRY OF THE PYTHAGOREAN TETRAD



*Figure B. The works of Iktinos and Mnesikles, the two leading architects of Athens during the fifth century B.C., show mastery of a method of constructive geometry based on a conical projection of a Golden Section ratio and self-similar spiral action. This constructive method formed the basis for the design of the Propylaea, the Parthenon, and the Erechtheion on Mount Acropolis. For example, the west elevation of the Propylaea is a composition of mixing the ratios of 2:1 (the octave), 3:2 (the fifth), 4:3 (the fourth), and the Golden Section.*

**Figure 3** The Pythagorean Tetrads projecting the Propylaea of Athens. Schiller Institute [\*A Manuel on the Rudiments of Tuning and Registration.\*](#)

**Figure 3** represents the transfinite projection of the higher dimensionality of the cone onto the lower dimensionality of the plane. The harmony that Pythagoras is referring to in the Tetrads ratios of the Fourth, the Fifth, the Octave and the Double Octave are determining the harmony of the spheres that Plato references in Republic X with the voices of the sirens singing the ordering of the planetary system. As Plato said:

And the spindle turned on the knees of Necessity, and up above on each of the rims of the circles a Siren stood, borne around in its revolution and uttering one sound, one note, and from all the eight there was the concord of a single harmony. And there were three others who sat round about at equal intervals, each one on her throne the Fates, daughters of Necessity, clad in white vestments with filleted heads, Lachesis, and Clotho, and Atropos, who sang in unison with the music of the Sirens, Lachesis singing the things that were, Clotho the things that are, and Atropos the things that are to be.”<sup>4</sup>

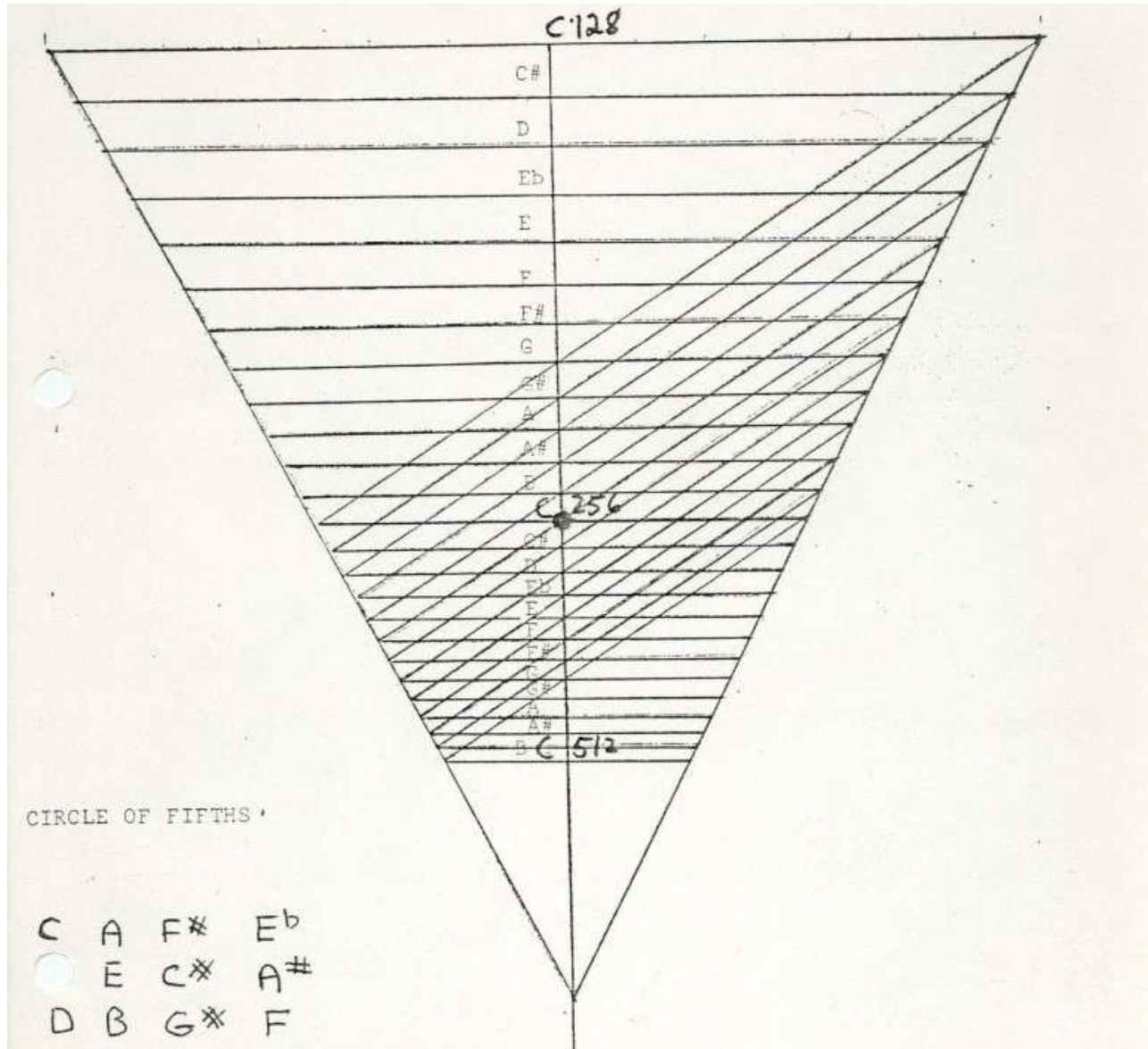
Thus, the movement of the revolutions of the spheres expresses the harmonic beauty of the universe, and in fact, the essence of the universe. But, this is also where the anti-Pythagoreans and the anti-Platonists were getting very upset, because they couldn't hear a single sound. They did not understand the science of music, and as a result, they reacted by reducing Pythagorean knowledge to some esoteric form of magical doctrine and made believe that their use of music was meant as a purgative means of purifying the soul of true believers. Thus, historians invented Pythagorean legends simply out of spite and ignorance, because they had no idea how to apply the Pythagorean Quadrivium with constructive means.

For example, according to historian Armand Delatte, Pythagorean priests used to scare the initiates and the more daring spirits by telling them the story of how one of their recruits, Hippase, perished in a storm at sea because he had

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<sup>4</sup> Plato, *Republic*, X, 617bc.

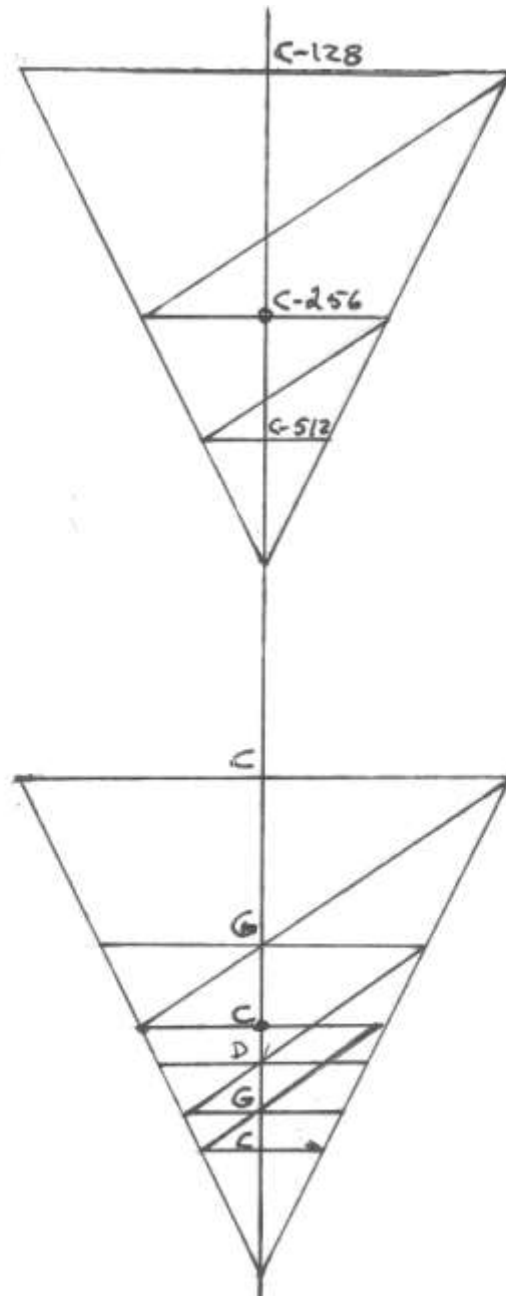
discovered how to inscribe the dodecahedron into a sphere.<sup>5</sup> The only sin he had committed, in fact, was to have acquired his knowledge by construction.



**Figure 4** Construction of the logarithmic equal-tempered system via the Circle of Fifths. From a strict geometrical standpoint, the Circle of the Fifths can start from G or F.

<sup>5</sup> Hippase of Metaponte was a Pythagorean geometer and mathematician who is associated with the discovery of irrational numbers and with the construction of the dodecahedron from the sphere.

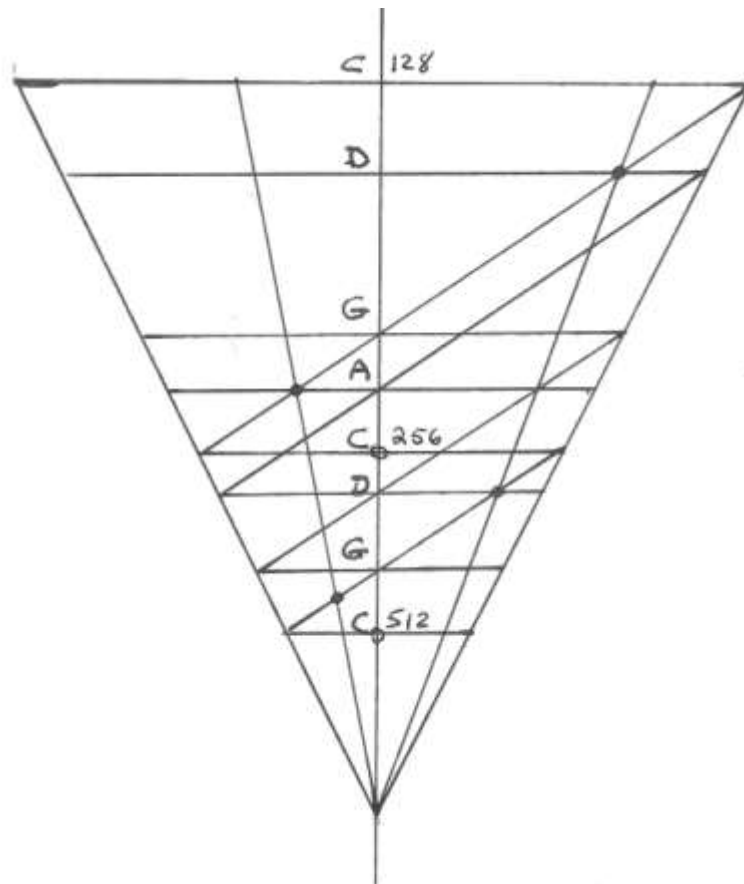
Let's do some geometrical constructions and see how the Pythagorean Tetrad can establish the Quadrivium by constructive geometry. Draw in color and in *successive order of position* all of the circular cuts and elliptical cuts of two equal-tempered musical octaves from C-128 to C-512, and by following each step of the Circle of Fifths. (**Figure 4**)



**Figure 5**

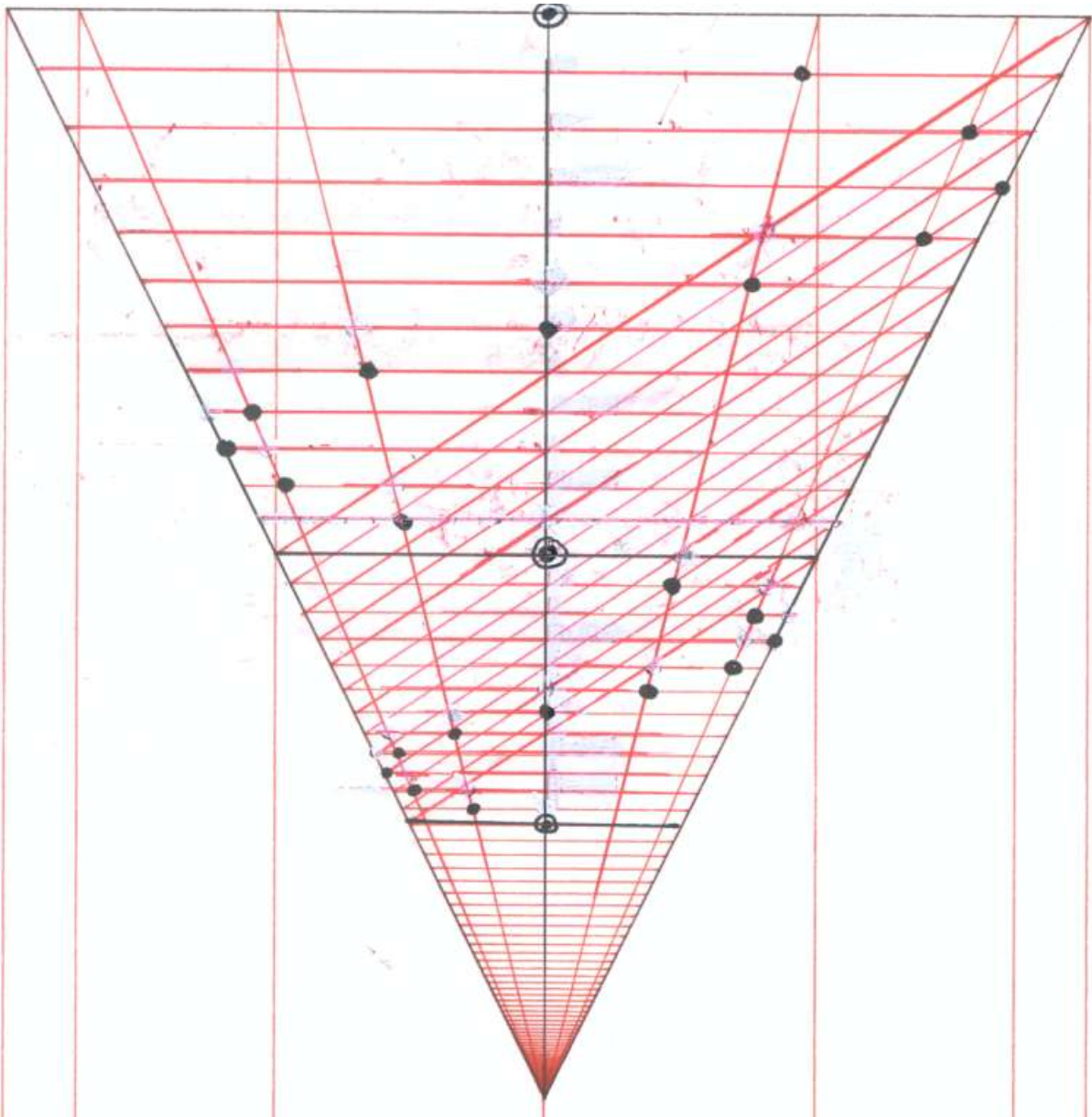


First, start by coloring the three circular cuts of the two octave range of C-128-256-512 and draw the two elliptical cuts between them. This will establish the boundary limits for discovering “the next steps” of the entire process. Second, color the two circular cuts of the octave of G.



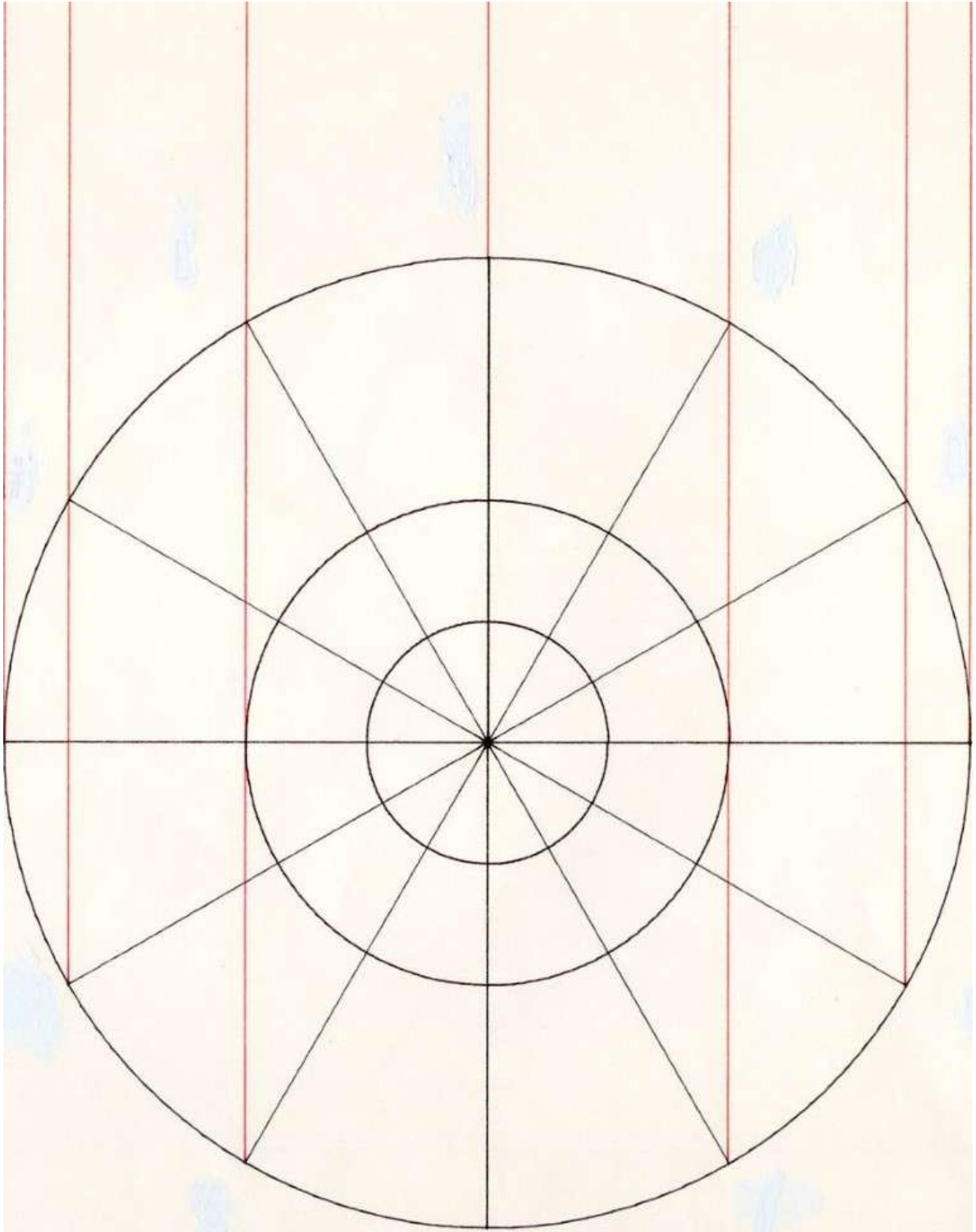
**Figure 6**

Once you have found the octave of G through the intersection of the axis of the cone, draw the circular cut through D and project a radius from the apex to the base of the cone through the new singularity located on one of the two boundary ellipses cutting D. Draw the elliptical cut of the D-octave. This will give you a new intersection point on the axis of the cone where you can draw the first circular cut of the octave of A. Next, find and color the second circular cut of the octave of A, and draw the elliptical cut of that octave.



**Figure 7**

Continue this construction until you have colored all of the twelve half-tones of the Circle of fifths, and locate the intersections of the 24 notes of the two octaves which can be found by projecting the radii of the plane circle back into the cone.



**Figure 8**

The second exercise is to locate precisely the spiral action going around that cone. Project the 24 conical notes of **Figure 7** onto the plane circle of **Figure 8** and draw the conic and plane logarithmic spirals. See **Figure 11** and **Figure 12**.

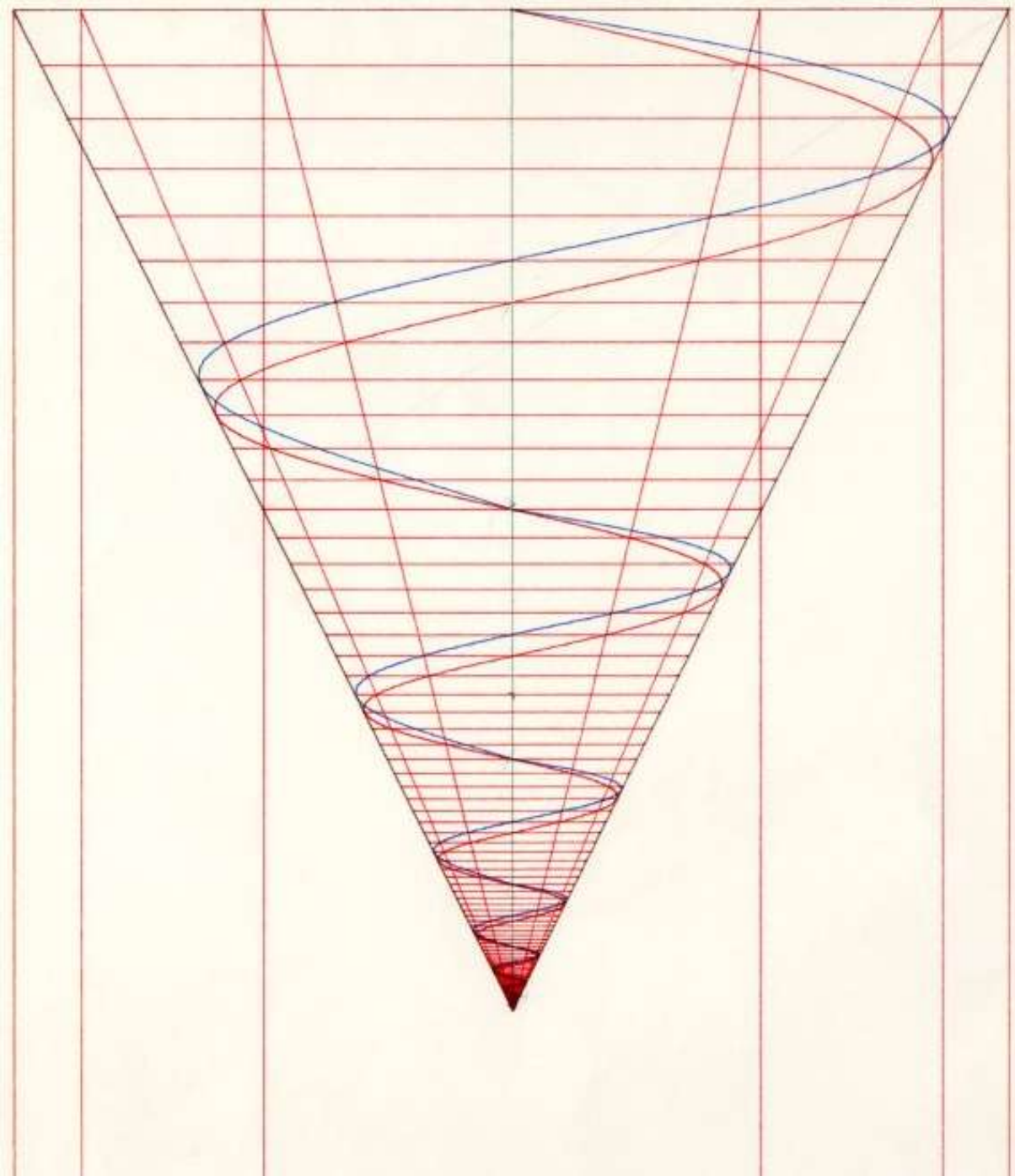
The reader will not reap the benefits of this geometric construction until he discovers that the Circle of Fifths intersects the three Tetradic sets of four Lydian intervals (**Figure 9**). In other words, in the physical domain, the astrogeometrical construction of the Solar System is based on the Tetrad principle of Lydian musical composition. It is in that sense that a particular knowledge can produce by construction the generative transformations of another.

THE PLANETARY ORBITS AND THE EQUAL-TEMPERED MUSICAL SYSTEM							
by WILLIAM BOHDAN							
PLANETS	ASTRO. UNITS	Log-10X	ADDED CONSTANT	MULTIPLE CONSTANT	CYCLE EQUIVALENT	MUSICAL CYCLES	PLANETS
MERCURY	(P) 0.310	0.5086	+2.496	x 128.8	255.97	C = 256	MERCURY
MERCURY	(A) 0.470	0.3279	" "	" "	279.25	C# = 271.22	MERCURY
VENUS	(P) 0.715	0.1457	" "	" "	302.72	D = 287.35	VENUS
VENUS	(A) 0.725	0.1397	" "	" "	303.49	Eb = 304.44	VENUS
EARTH	(P) 0.983	0.0074	" "	" "	320.52		EARTH
EARTH	(A) 1.017	0.0073	" "	" "	322.42	E = 322.54	EARTH
MARS	(P) 1.379	0.1396	" "	" "	339.46	F = 341.72	MARS
MARS	(A) 1.661	0.2204	" "	" "	349.86		MARS
ASTEROIDS	(P) 2.2	0.3424	" "	" "	363.32	F# = 362.04	ASTEROIDS
ASTEROIDS	(A) 3.6	0.5563	" "	" "	393.13	G = 383.57	ASTEROIDS
JUPITER	(P) 4.95	0.6946	" "	" "	410.95	Ab = 406.37	JUPITER
JUPITER	(A) 5.45	0.7364	" "	" "	416.33		JUPITER
SATURN	(P) 9.006	0.9545	" "	" "	444.43	A = 430.54	SATURN
SATURN	(A) 10.074	1.0032	" "	" "	450.69	Bb = 456.14	SATURN
URANUS	(P) 18.288	1.2622	" "	" "	484.05	B = 483.26	URANUS
URANUS	(A) 20.092	1.3030	" "	" "	489.31		URANUS
NEPTUNE	(P) 29.799	1.4742	" "	" "	511.36		NEPTUNE
NEPTUNE	(A) 30.341	1.4820	" "	" "	512.37	C = 512	NEPTUNE

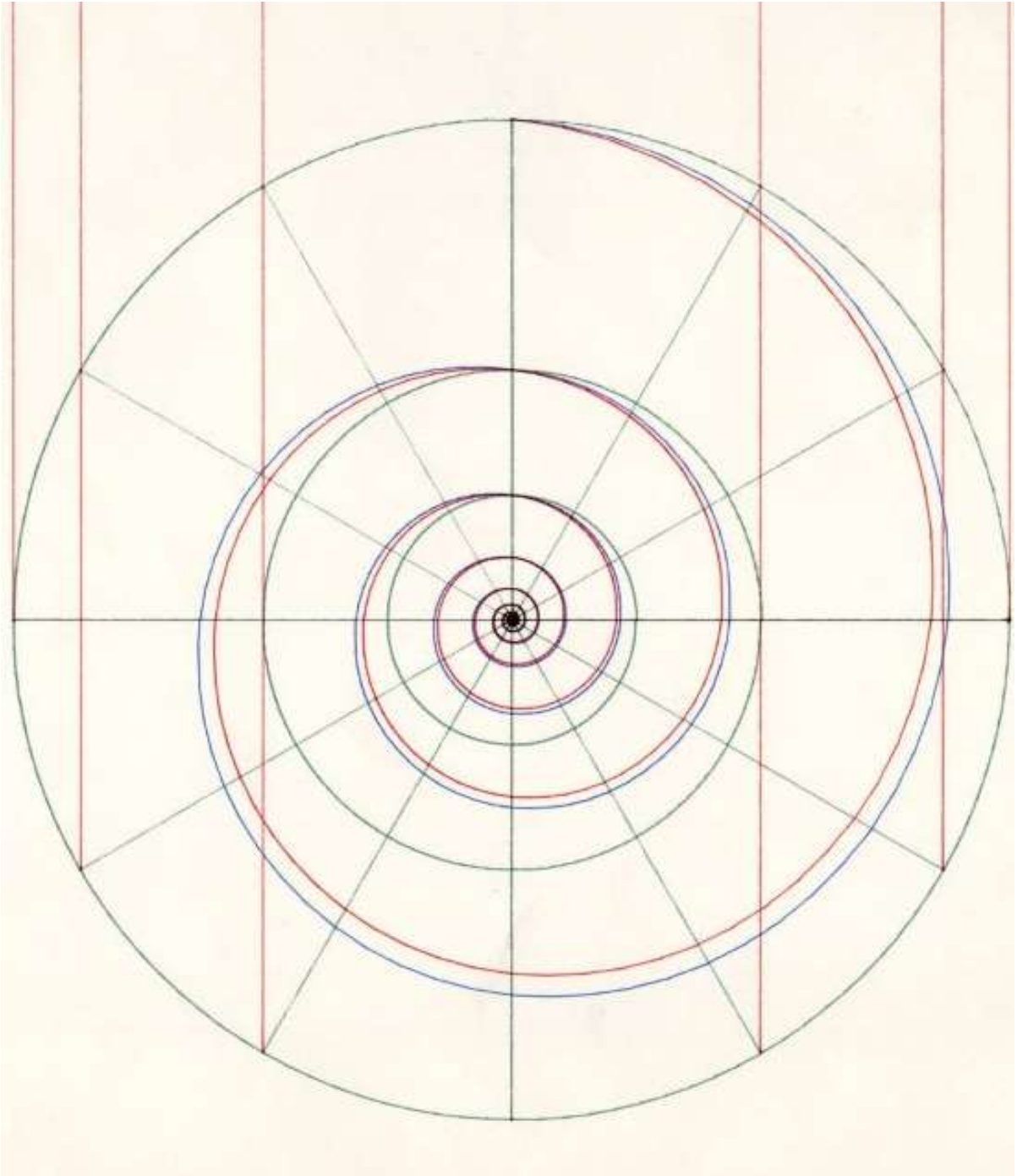
**Figure 9**

The Pythagorean Tetrad does not engender ideas or things as such but shows how ideas develop from a higher dimension to a lower dimension. In that sense the Pythagorean Tetrad represents the four essential forms of knowledge whose epistemological characteristics embody what Lyn identified as the transfinite function of the human mind. The Pythagoreans themselves, including Plato, understood this transfinite process as being ascribed to the progression of the four

different degrees of knowledge which are feeling (*αἴσθησις*), opinionating (*δόξα*), thinking (*νοῦς*), and knowing (*ἐπίστήμη*).



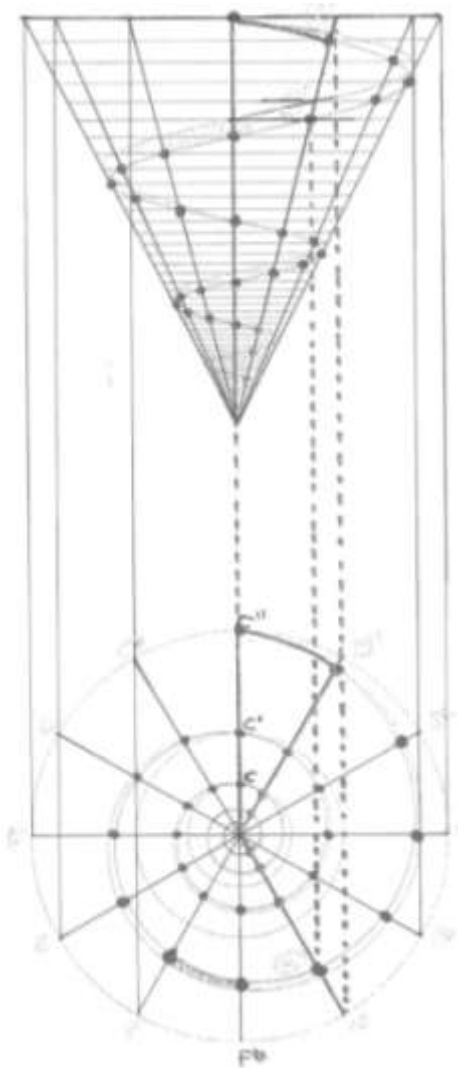
**Figure 10** The arithmetic spiral (blue) and the geometric spiral (red).



**Figure 11**

## CONCLUSION

In conclusion, note how the reciprocal opposition between the cone and the circular plane reflects the *ordering in position* of two different transfinite manifolds. This demonstrates that such an *ordering in position* of the Pythagorean Tetrad is a time reversal Promethean shadow of the byquadratic reciprocals of St. John's Genesis Prologue (1:1-5):



*“In the beginning was the Word.  
And the Word was in God, and was God.*

*All things came into being through Him,  
And apart from Him, nothing came into being.*

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*What has appeared in Him was life,  
And the life was the Light of men.*

*And the light shines in the Darkness,  
And the Darkness cannot overcome it.”*

(John 1: 1-5)

**Figure 12** The transfinite cone/plane *ordering in position* and John 1: 1-5, Genesis.

From the vantage point of epistemology, there is a similarity between the jump from finite to transfinite in mental processes and in numbers, which is that in both cases, a higher *unity of the many* is established inside of the mind. The natural increase in numbers of the Tetrad (10 as the unity of 1+2+3+4) corresponds to the establishment of something which is completed in the same manner as if the unity of four dimensionalities were being completed in the creative mind by means of the same proportional synthesis; that is, what Leibniz had called the Art of Invention. All natural creatures express such a growth of composition in their completeness and this is the reason why the Pythagoreans found it natural to apply the same principle to all things.

If this process comes to such an end with numbers, it is because this is how ideas generate the same process in the fulfillment of their intentions. In other words, if the first four numbers produce the decade, it is because the four reciprocals of John's Prologue replicate the creative process of God's mind. Furthermore, it was also quite natural to assimilate the solid Tetrad with fire, because the process of its transfinite composition from the point, to the line, to the surface, to the solid tetrahedron was a reflection of how to capture the fire of God and restore it to man as did Prometheus.

Thus, it is not surprising that the Promethean Tetrad doctrine of Pythagoras and St. John's Genesis Prologue have a direct affinity. By developing the creative process of transformation of the human mind in the image of God, the Pythagorean Tetrad represented the greatest danger for the privileged power of the Zeusian control over mankind. It is not an accident that such a power in the hands of mankind today is strong enough to bring together the four corners of the world into a win-win policy of human self-development against the losing Satanist worldview of the British Empire. This Pythagorean and Platonic view of the universe is entirely coherent with the LaRouche understanding of how to measure the "curvature" of the universe as a whole. As Lyn wrote in 1988, on the necessary notion of "Absolute time":

"We have shown, in earlier locations, that the space-time curvature of creative processes is identical with that of astrophysical, microphysical, and



biophysical space-time. This congruence is the sole basis for the possibility of real human knowledge of the universe. Thus, nothing called human knowledge is knowledge in fact, unless it expresses directly the product of creative-mental processes, as opposed, for example, to the axiomatic linearity of all formal deductive reasoning. Thus, only the intelligible representation of those mental acts of our species, by which valid fundamental discoveries in physical science are generated and assimilated efficiently, represents something truly appropriate to the connotations of “scientific knowledge.”<sup>6</sup>

Finally, the point to be made is that such a “curvature” of the universe as presented by Lyn is not to be found by searching into far reaching Gravitational Waves, but by paying attention to something which is much closer to home; that is, to the creative power of imagination which causes your mind to increase in energy-flux density.

So, the *unique link* which unites all of these ideas is not number, but *constructive ordering in position*. The *unique link* of all these things, as Plato identified in the last page of his *Epinomis*, is reciprocal proportionality of the creative process of construction: “*This is the road we must tread.*” (Plato, *Epinomis*, 992ab.)

**FIN**

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<sup>6</sup> See [LYNDON LAROUCHE, A NON-MYSTICAL VIEW OF THE NECESSITY OF EXISTENCE OF THE NOTION OF 'ABSOLUTE TIME', 1988](#)