RAPHAEL'S CONSTRUCTION OF THE COINCIDENCE OF OPPOSITES IN 'THE SCHOOL OF ATHENS'

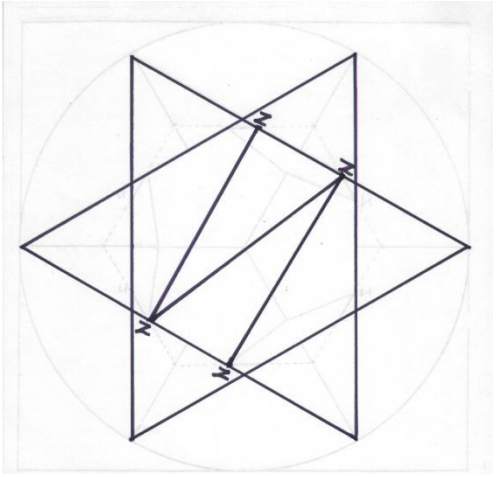
How to integrate platonic ideas into the real world

Pierre Beaudry, 3/29/2021

FOREWORD

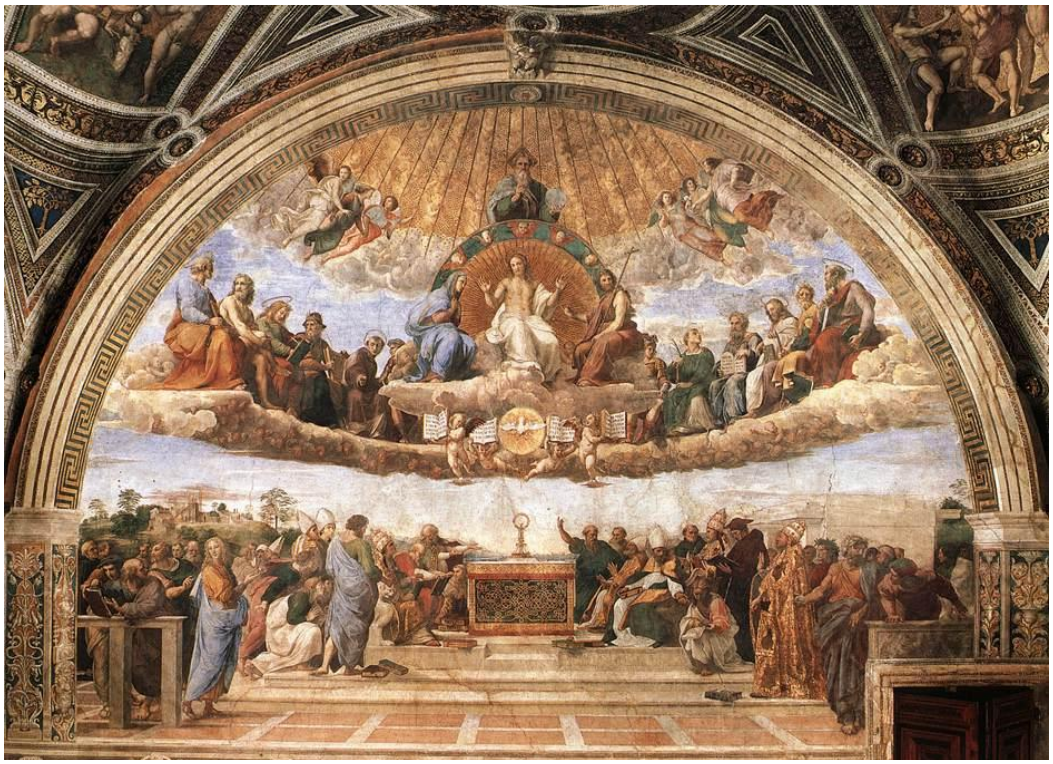
This report is a review of the discovery of principle behind linear and ideal perspective, which I made thanks to Lyndon LaRouche more than 25 years ago, in 1994, and which I invite the younger generations of would be geometers to rediscover by constructing the discovery of principle that Raphael made for his two frescoes, *The School of Athens* and *The Dispute of the Holy Sacrament*; that is, the discovery of principle of unity between philosophy and theology.

This discovery does not require any academic knowledge whatsoever; on the contrary, all that is needed is a critical and inquiring mind into constructive geometry, which enables you to discover the solution to Plato's paradox of the One and the Many. All you have to do is to connect lines to points and points to lines that are already given or find other connecting lines by yourself, starting from those that are already located in this ironic Star of David that Raphael drew on a tablet laying on the floor of *The School of Athens*.



Raphael's anomaly for the *Stella della Segnatura*

Raphael Sanzio, *The School of Athens*. 1510



Raphael Sanzio, *The Dispute of the Holy Sacrament*, 1509.

INTRODUCTION: PLATO'S THE ONE AND THE MANY

The challenge, here, is to discover how the individual human mind relates to the universe as a whole, and how the crucial entry point of accomplishing such a design, as Raphael's, is accomplished through a three-dimensional spherical concept of the *simultaneity of eternity*; that is, through setting your mind as acting in the present, the past, and the future at the same time, and by time reversal, as if you were located in the center of a sphere inside the *Stella della Segnatura* of the Vatican. This is not as easy to conceive as it appears to be, and yet Raphael mastered the way to bring together in both of his major frescos, tens of individual minds, who lived at different times during a span of at least eighteen hundred years, into a single assembly where they engaged in dialogues with one another, for the purpose of letting future observers experience the unique and eternal historical creative moment of the late Italian Renaissance.

Raphael's unique moment of *simultaneity of eternity* is a true moment of human creative power of axiomatic change. Nature has great powers, but Raphael shows, here, that man has a greater power to create power itself by means of such a transfinite integration of physical space-time, which causes the entire universe to change as a result. However, what is a little more difficult to accomplish, is to maintain that transfinite relationship as constant as a continuous form of knowledge, whereby any human individual is able to share with others the creative powers of such a historical relationship. Raphael accomplished this in the footsteps and in the company of close friends such as Plato, Nicholas of Cusa, Leonardo da Vinci, Louis XI, and Jean Pelerin Viator. Lyndon LaRouche recommended the same as follows:

> "First of all, if every human mind is engaged in fruitful, creative activity, according to principles of creative reason, it is efficiently acting upon the past, the present, and the future, of mankind. By acting upon mankind, i.e., mankind's practice, we are acting upon the universe as a whole, past, present, and future. This, as I have said, is the individual, the sovereign creative power of reason in the individual, unmediated relationship to universality.

"Thus, the practical relations of mankind, in terms of the individual, to the universe are so defined. So, the substance of the practical relationship between the individual on the one hand, and the universe, and the human species in the universe, and all aspects of practice subsumed by the human species or impinging upon the human species, are in a relationship so defined; that is, defined in terms of this principle of practical reason.

"That means that the universe is defined for us as composed of sovereign monads: human creative reason, in this kind of multiple relationship to the universe. The universe, taken as a whole, is thus *One*, an unmediated *One*, as indicated, the essential *One* (Footnote: See Plato, *Parmenides*).

"Otherwise, reason is related to other objects in the universe, other created objects, and so forth, in that universe. But, always in its relationship to other objects, the primary, unmediated relationship between the particular and the universal subsumes, and is the substance, of all relations to other objects."[1]

The transfinite idea of this *simultaneity of eternity* corresponds to the One of Plato's *Parmenides*, as opposed to the Aristotelian Many of day to day life. The point that LaRouche is making is that, unless you willfully make this distinction very clearly in your own mind, the tendency will be to slip back into the practicalities of the Many; that is, into the Aristotelian entrapment of the daily routine that is ordered from moment to moment by a universe of sense perceptions. In other words, it is your own personal immortal humanity, which lives as the One inside of you and not your personal mortal individuality; because it is humanity inside of you which unites you to the universe as a whole and gives you closure. That closure is the fundamental epistemological connection which makes you discover the difference between Plato and Aristotle; and this is the closure that Raphael used to compose his frescos based on Jean Pelerin Viator's central three-

[1] Lyndon LaRouche, ***Project A***, p. 15. The precise area where the transfinite issue of One and the Many is posed most adequately in Plato's Parmenides, can be found in HYPOTHESIS III: If the One is and is not, what are the results? (156a-157b).

point perspective, together with Leonardo da Vinci's method of composing Platonic solids as illustrated in Luca Pacioli's *De Divina Proportione*.

PLATO'S ONTOLOGICAL PARADOX AND VIATOR'S THREE-POINT PERSPECTIVE PROJECTION

Plato's Parmenides paradox of the One and the Many was the political test to be solved in Europe during the revolutionary period which followed the Council of Florence of 1439, where Nicholas of Cusa, the networks of the Brotherhood of the Common Life, and the Augustinian movement all participated in organizing Jeanne d'Arc, King Louis XI, and his associates to transform France into the first sovereign nation-state of Europe.

It was through his crucial alliance with René II, Duke of Lorraine, that Louis XI succeeded in unifying France against the Duke of Burgundy, Charles the Rash, and through the invaluable cooperation of the Canon of Toul, Jean Pelerin Viator, who was successively diplomat, personal secretary, and confessor to Louis XII, to Philippe de Commines, and to René II. Viator also succeeded in creating the victorious alliance between King Louis and the Duke of Lorraine, René II, against the Duke of Burgundy, Charles the Rash; an alliance which led to the unification of the French nation at the death of the Duke at the battle of Nancy on January 5, 1477.

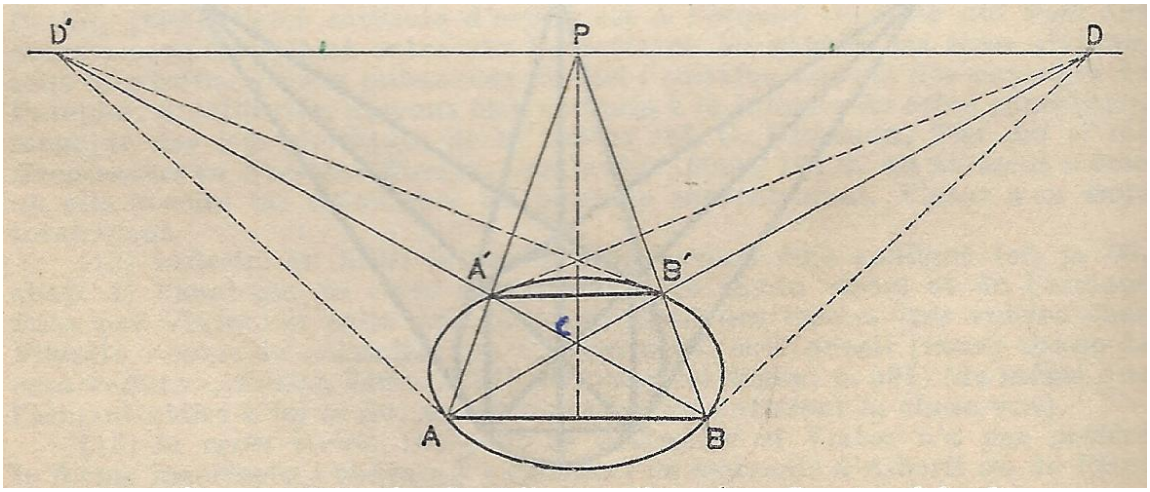
It should be known, universally, that it was Viator who wrote the couplet commemorating the decisive victory of Duke René II of Lorraine that made the unification of France possible:

Ereptam patriam Dux ensifer ense recepit
Qui divina fovens juris armator erat.
[With the help of God, the Duke, fully armed friend of goodwill, has reunited the torn fatherland.] Viator

One of the most important discoveries of Raphael was the application of Viator's "*intellectualiter"* conception of central perspective, which was published in Lorraine in 1505 under the title: *De Artificiali Perspectiva*. No full proof evidence has been found to indicate that Raphael knew about this publication, in particular, but there is sufficient evidence to corroborate the fact

that Leonardo met with Viator in Italy, during the 1490's, and that Raphael may have applied the new conception by way of Leonardo. There are, in both Viator's papers and in Leonardo's Codex Atlanticus, indications that they may have met in Pavia with a common friend by the name of Francisco di Giorgio Martini. The author of Viartor's monograph, Lilian Brion-Guerry identified the importance of the first publication of Viator's treatise contrasting perspective with Alberti's construction:

> "I remind you that when his treatise on artistic perspective (*De Artificiali Perspectiva*) was published at Toul, in 1505, those of Alberti, of Piero della Francesca, of Filatere, of Foppa were only circulating in the form of manuscripts, as were the notes of Leonardo da Vinci on painting. This is the first European publication on the subject, and above all, the only one which developed a method on the receding of space, which was used in the Northern European region of the Alps. By virtue of that fact, Viator established, all by himself, a parallel current to the one which had been established with the elaboration of the '*construzione legitima*'. Similar to the latter, but in a different manner, Viator bears witness to a profound revolution in the conceptions of space which initiated a new era of human thinking."[2]



[2] L. Brion-Guerry, *Jean Pelerin Viator, sa place dans l'histoire de la perspective*, Société d'Edition les Belles Lettres, Paris, 1962, p. 415-416. Translated by Pierre Beaudry.

Jean Pelerin Viator's three-point perspective. Note that the harmonic ordering of Viator's complete quadrilateral proportion **AB' : CB' = AD : B'D** is a natural derivative of the divine proportion of Leonardo and Pacioli in the sense that the system works like a mirror image of the natural stereographic projection of the human binocular vision of a three dimensional image.

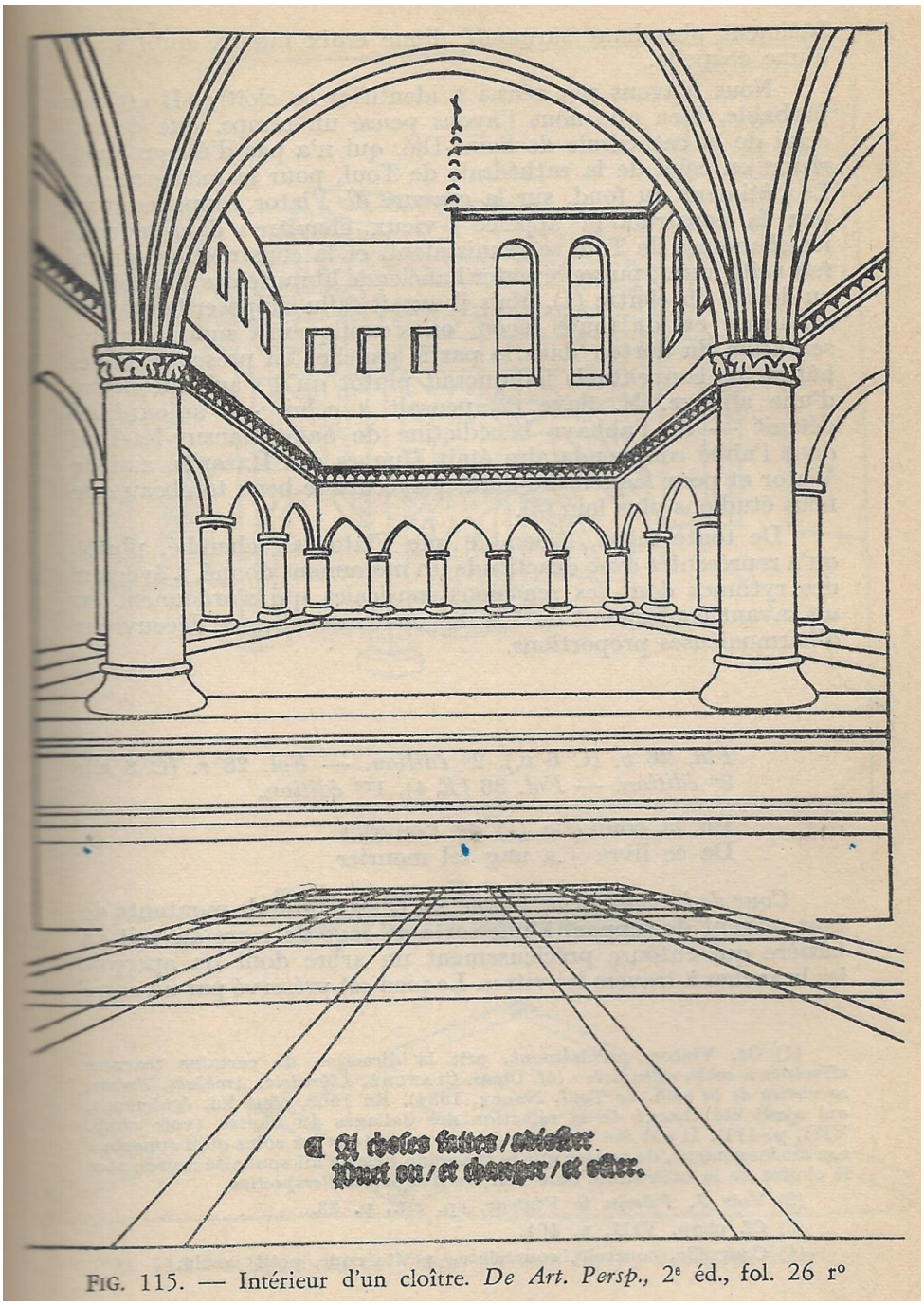
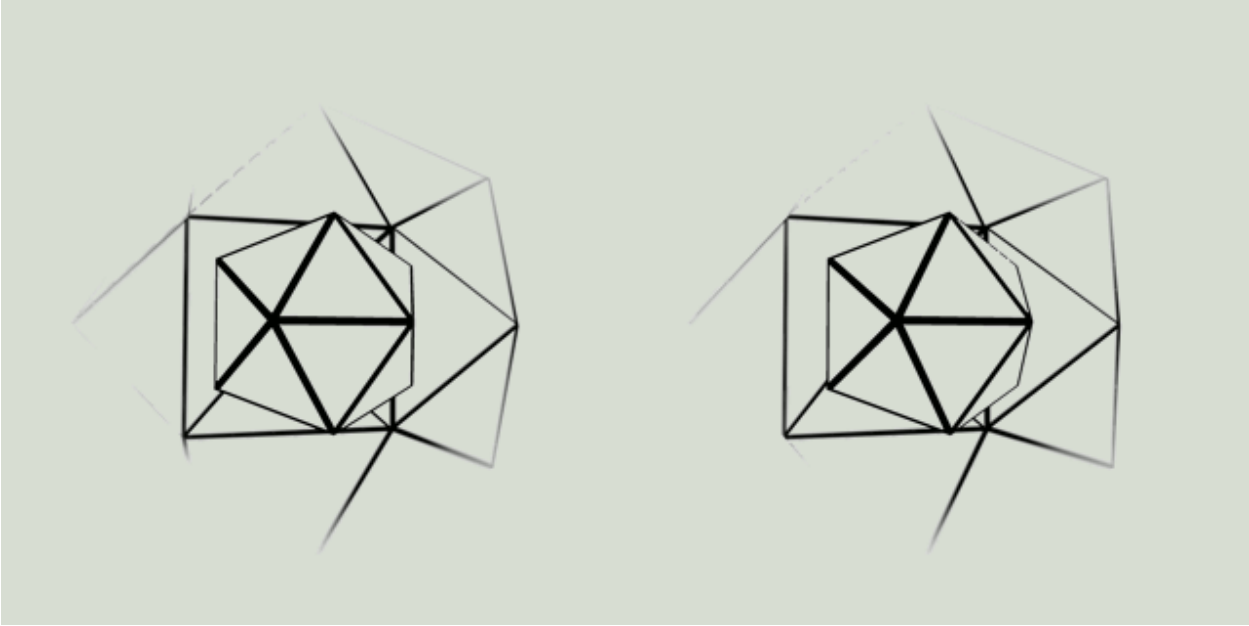


FIG. 115. — Intérieur d'un cloître. *De Art. Persp.*, 2e éd., fol. 26 r°

Jean Pelerin Viator, Cloister interior

It is the triply-connected aspect of binocular vision which causes the human eyes to see the protruding effect of the third dimension. For example, see below the case of the stereographic effect of bringing together the two icosahedrons into a single one, simply by crossing with your eyes one image over the other. Once your eyes lock the two icosahedrons together as one, you can peruse easily every part of the central 3D image in the middle of the other two:



Cross your eyes over the two images to see a floating third image in 3D in between; an image of the *coincidence of opposite.* https://imgur.com/gallery/XWa7ErC

This crossview effect is not a magical trick; it is the process of how binocular vision is made to fuse together two opposite flat images of the same object, such that the sight of a third image of that object coincides into a single one of three dimensions between them. This is what the mind sees in a *coincidence of opposites*, as the axiomatic unity between two opposite dimensionalities.

The point to be made about Viator's three-point perspective projection is that it is the conceptual analogue of such a stereographic projection. The Viator model is not merely an empirical, mathematical, or rational method; it is foremost an ideal transfinite method of constructive geometry that Nicholas of Cusa would have called *intellectualiter* in the tradition of Plato and Pythagoras; that is, in the

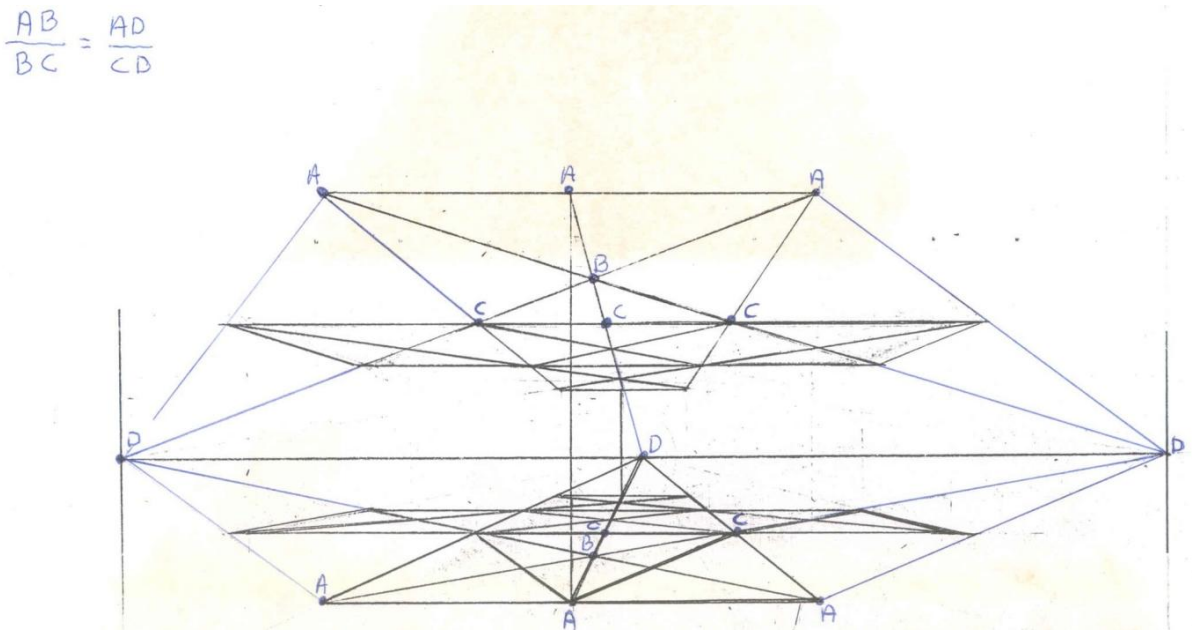
traditional Pythagorean quadrivium of Geometry, Astronomy, Music, and Arithmetic (GAMA). Viator's method was understood and adopted not only by Leonardo and Raphael in Italy, but also became in France the basis for the geometry schools of Desargues and Pascal, of Leibniz, of the Ecole Polytechnique of Monge, Carnot, and Poncelet, and also of the German schools of Jacob Steiner and of Riemann in Germany and of Lyndon LaRouche in the United States, today. If ever there was a One of the Many throughout the history of ideas, this is the One.

Both Viator and Leonardo had a similar conception of human vision as being both active and passive at the same time; both methods also have immense epistemological potential for science, artistic composition, and epistemology. For example, Leonardo identified the spherical nature of atmospheric luminosity and of the human eye as being both a "target and a magnet."[3] Similarly, for Viator, the human visual function both receives and reflects light rays like the complex function of a caustic "burning mirror."[4] Thus, for both Viator and Leonardo, vision is the intersection of visual light and shadow pyramids which intersect in spherical space through an infinite number of visual and physical rays which are constantly transformed inside of a changing and unified field. Viator's dynamic perspective model was also in harmony with the "*intellectualiter*" conception of Nicholas of Cusa's epistemology whereby:

> "A perfect equidistance between different things can only exist in the mind of God, because only God is Infinite Equality. Therefore, He who is the center of the world, that is the blessed God, is equally the center of the Earth, of all the spheres, and of everything in the world. Similarly, God is also the Infinite Circumference of all things."[5]

[3] *Les Carnets de Leonard de Vinci*, Gallimard, Paris, Vol. 1, 1942, p. 214.
[4] Lilianne Brion-Guerry, *Jean Pelerin Viator, sa place dans l'histoire de la perspective*, Société d'Edition les Belles Lettres, Paris, 1962, p.108. « *Lumiere ne ist pas de lueil mais la clarte exterieure cheant en iceluy reflecte comme dans un miroir ardent : par quelle reflection les formes des choses sont concues et apprehendees.* » *De artificiali perspectiva Viator tertio* (fol. 2 r., 2e ed., chap. I). (Light does not come from within the eye but from the external lucidity falling upon it as if on a burning mirror and through whose reflection things can be apprehended, and conceived.)
[5] Jasper Hopkins, *Nicholas of Cusa on Learned Ignorance*, The Arthur J. Banning Press, 1990.

In Cusa's mind, an infinite circle is not required to really exist physically. However, it did exist as an epistemological construct, which he made use of in order to break with the deductive Aristotelian view of the contradiction of opposites. What Aristotelian minds do not understand is that the intellectual power of infinity is such that if it admits that an infinite circle must be eternal, then nothing prevents its circumference from also being its center. In the Viator three-points perspective, there exists a similar affinity within the visual representation of things, because any measure of receding space can be found to be the equivalent of any other provided it has the quadratic proportion where AB:BC = AD:CD; and that is, everywhere, infinitely, and in all directions. This is what Viator called the "Positive Perspective" or "Divine and Glorious Perspective" (*la dive et glorieuse perspective*) that Jacob Steiner will later identify with the unity of the complete quadrilateral.[6]



Pierre Beaudry's rendering of Viator's hexagonal three-point perspective

This triply-connected quadratic measure is the closest means that man has so far been able to discover in order to come close to God's Unity of Equality, as in the Holy Trinity, the "Divine and glorious Perspective." In other words, the

[6] See my report: **THE GEOMETRY OF THE ONE AND THE MANY: THE METAPHOR OF PERSPECTIVE.**

universe may be considered spatially unified and equal in all of its parts whenever a conceptual proportion between objects can be attributed to them without exception and everywhere in the same quadratic triply-connected fashion; that is, when an exact relationship between the heights, depths, and widths of all things in receding space is conceived as interrelated by a uniform proportion which can be produced from any thee projection points on the infinite horizon, provided they are equally distant from each other: ***AB:BC = AD:CD.*** *That is the very core of the epistemological nature of the One and the Many in Artistic Composition*.

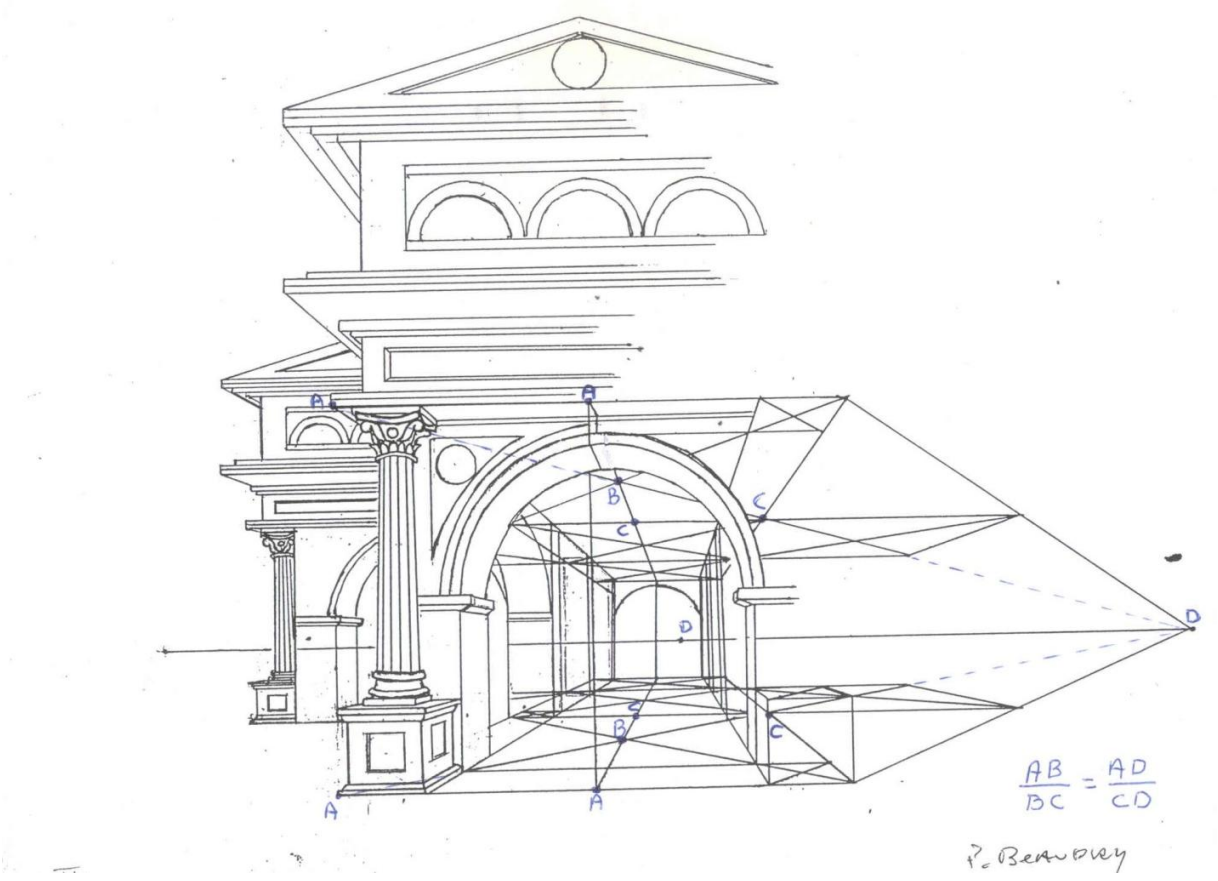
Similarly, for Leonardo and Raphael, perspective is much more than a perceptual apparatus or an empirical construct; it is an epistemological process of composition. It was, for example, by conceptualizing the spherical complexity of human vision and of universal generation of axiomatic changes that Leonardo adopted a conception of perspective which cohered with the propagation of light and shadow following the principle of Plato's ontological paradox of the One and the Many. This form of composition is such that "The image of any opaque body is entirely included in the whole and in each part of the transparency that surrounds it."[7] Leonardo explains the process as follows:

> "The air is filled with an infinite number of images of things, distributed across its span, all in all, all in one, and all in each; such that if two mirrors were placed one in front of each other, the first would be reflected into the second, and conversely. Therefore, by mirroring itself into the second, the first transmits its own image as well as that of all of those it contains, including among them, the image of the second mirror; thus they maintain a continuous exchanging of their resemblance ad infinitum, in such a manner that each mirror contains an infinite number of mirrors which grow infinitely small by integrating themselves into each other."[8]

Raphael's conception is also based on that Leonardo conception whereby the visible domain is generated by the intersection of light propagation and visual pyramids which follow the same laws of the unity of proportion and the same

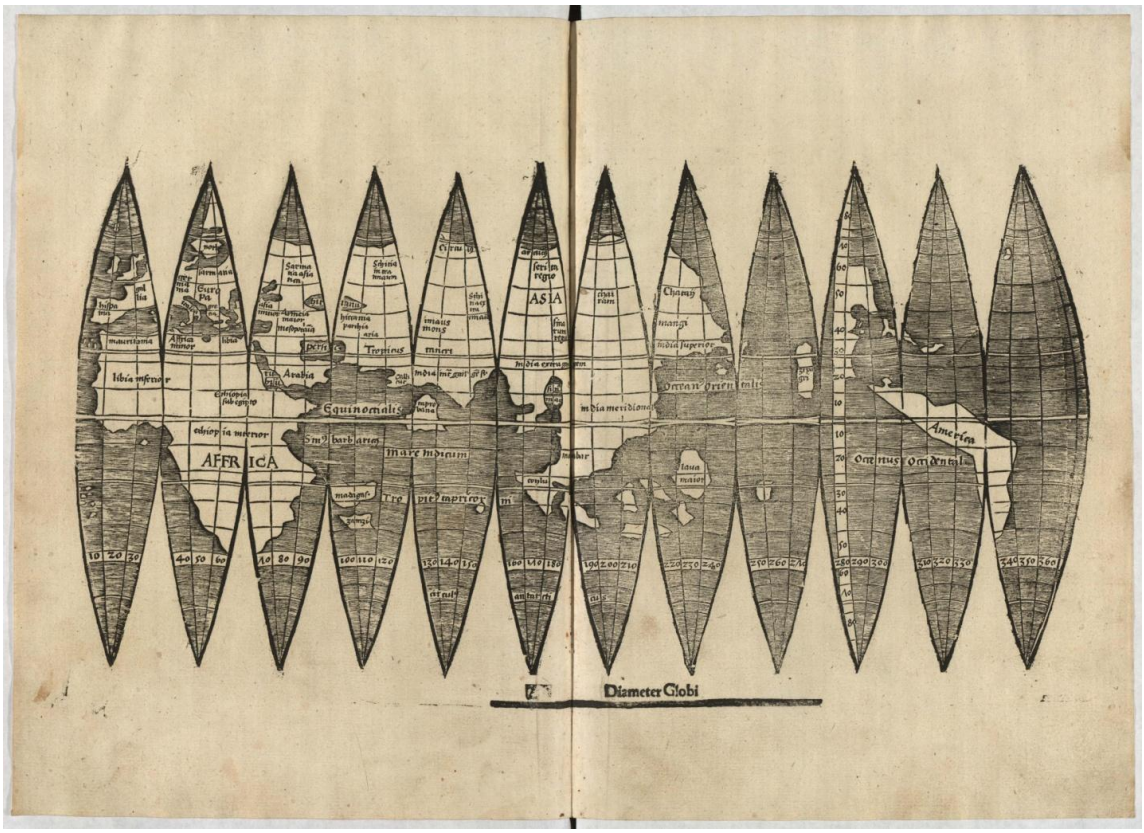
[7] Les Carnets de Leonard de Vinci, Vol. 2, Paris Gallimard, 1942, p. 272. Translated by P. B.
[8] Ibidem, p. 301.

harmonic arrangement as the three-point perspective of Jean Pelerin Viator, where their mutual proportions are: **AB : BC = AD : CD.**



The hexagonal principle underlying Viator's original conception of harmonic linear perspective has the same proportionality as Jacob's Steiner's complete quadrilateral

In the same year, 1505, Viator was one of the founding members of the Vosges Gymnasium of Saint-Dié-des-Vosges, created by Vautrin Lud, chaplain and secretary of the Duke of Lorraine. Mathias Ringmann, a leading figure from the Brotherhood of the Common Life from Deventer, Netherlands, became the director of studies for the Gymnasium. Viator was instrumental in creating the first spherical world map produced by the cosmographical group of the Vosges Gymnasium, which was the first to identify the continent of the new world under the name of "America."



Spherical world-map from the St-Dié Gymnasium with the identification of "America."

THE CONSTRUCTION OF RAPHAEL'S SPHERICAL-DODECAHEDRAL PRINCIPLE

Single point central perspective: what the mind sees as beautifully ordered as One

Upon first seeing the scene of *The School of Athens* the viewer is struck by the opening shutters of his own universal mind; that is, a mind that is struck inwardly by the strong attractive shock of central perspective, whose center radiates in all directions and attracts the viewer's attention like a magnet into a rectangular shaped elevated space, which includes both Plato and Aristotle on each side of the exploding center.

Such a striking scene also extends outwardly into the architectural frame of great arches that architect Raphael borrowed from Donato Bramante's original drawing for the Vatican Church of Rome, and which extend their projections in the open air, simultaneously, into the heaven. The *coincidence of opposites* of those two motions, inward and outward, *enfolding and unfolding*, is the unique experiment of *simultaneity of eternity* that Raphael constructed in the *Stanza della Segnatura*, as if the whole of the universe could be taken into one of its smallest parts, your mind.

After perusing the entire space of the fresco in all of its details, the observer is eventually attracted by another magnetic-like force located, this time, in the lower right corner, where he is struck, a second time, by a very agitated group of young boys surrounding Donato Bramante who is marking a tablet on the floor with his compass. Here, the observer is expected to become completely perplexed in examining closely what the architect is measuring. What is that enigmatic geometrical figure drawn on that tablet lying on the floor? What does it mean? Is it simply a fanciful composition, or is it something that is calling out the observer to investigate? What are the boys excited about, and why is one of them pointing simultaneously at the figure and staring at the heavenly sphere that Zoroaster is holding in his hand? What discovery is he making?

There is an enigmatic aspect of the Bramante drawing which poses a real puzzling problem because of the geometrical use of only linear extensions: How can the mind go from two to three dimensions simply by manipulating straight lines and points of a lower dimensionality? Where is the non-linear discontinuity which LaRouche posed as a precondition for solving axiomatic problems in *Project A*[9] when he introduced the question of singularities between axiomatically

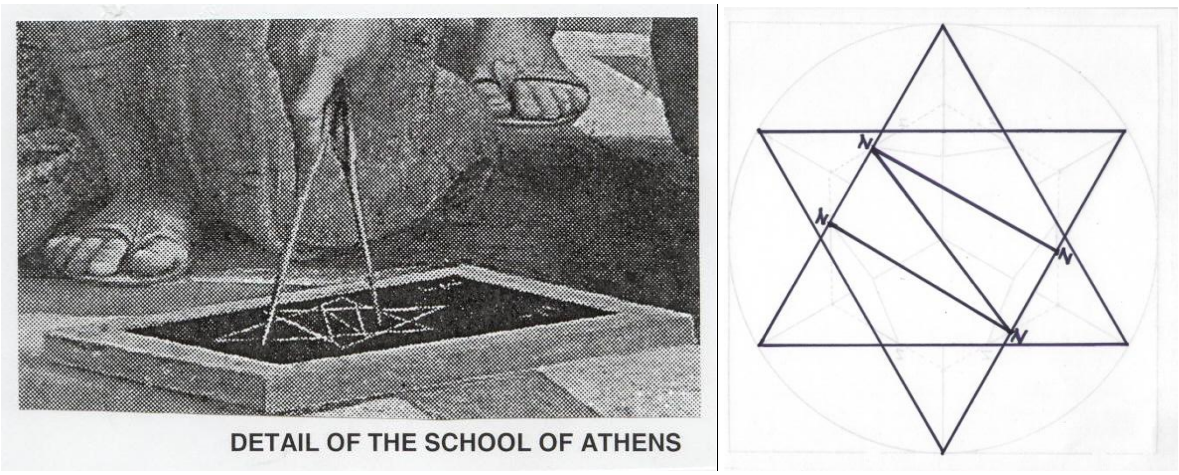
[9] Lyndon LaRouche, ***Project A***, EIR, Vol. 17, No. 41, October 26, 1990, Euler's fallacies on the subjects of infinite divisibility and Leibniz's monads. "One thing added, as a footnote: Microphysics and astrophysics do not simply stand independently of the universe of the scale of simple observation; but, there is a point of scale at which, in the vicinity of whatever boundary condition is defined, we must *change*. We must recognize that we can no longer rely simply on simpler elementary methods of observation, but must change our view to accommodate the fact that we are approaching a singularity. Thus, in practice and in fact, as we get into the very small, divisibility of the ordinary sense *vanishes*, as it does as we get into the astrophysical scale, where the relativistic considerations remind us, or should remind us, that we are approaching a boundary condition in that respect." p. 66.

different dimensions. How can the mind go from two to three dimensions without having to go through a change of measure, or a discontinuity?

The geometry group around Bramante and the astronomy groups with Raphael's self-portrait

My hypothesis is that Raphael provided, here, the key to solving Plato's paradox of the One and the Many, otherwise known as the *Parmenides* Ontological Paradox. Not only did Raphael create here, a puzzle, for the observer to unravel, but he also painted his own portrait within the astronomy group in the right lower

corner of the fresco, as if to say to that same observer: "Don't you think you should investigate what is afoot here?

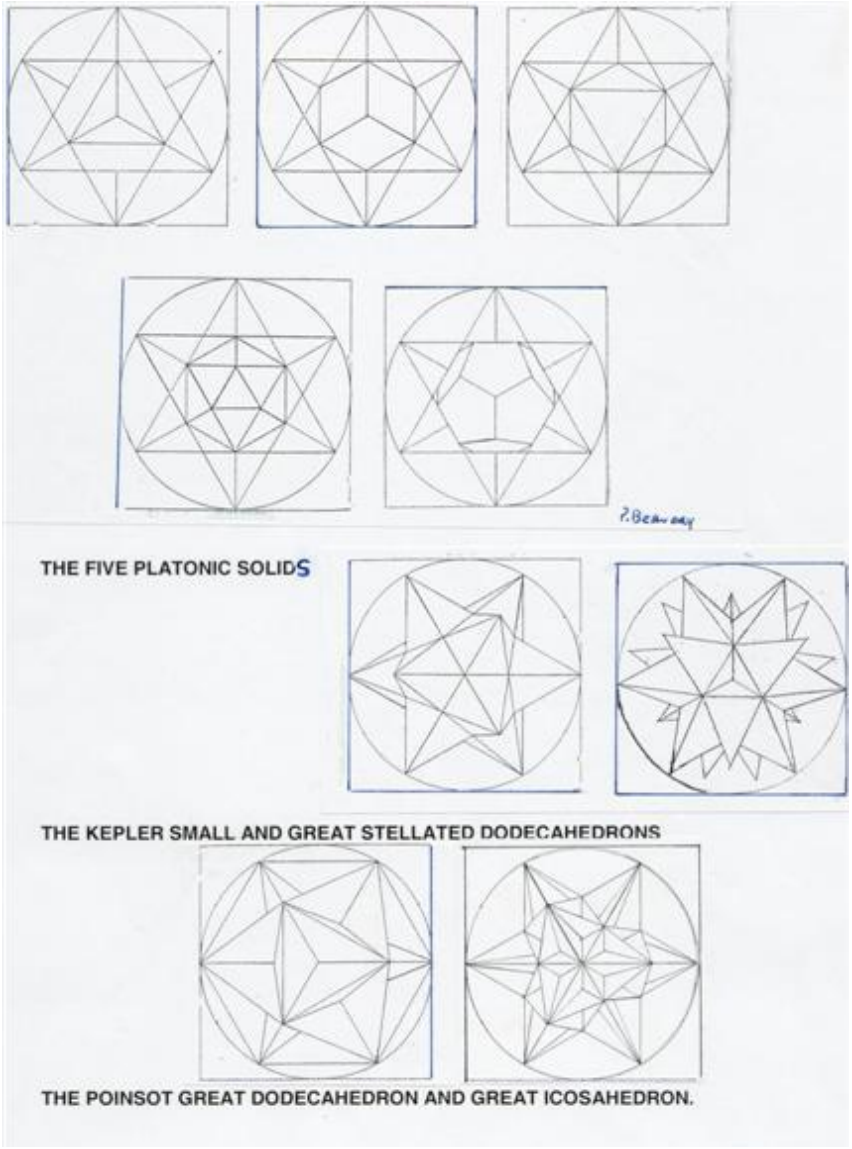


The Bramante Star of David

Pay attention to the Bramante geometrical drawing and especially to the quadrature of the four points formed by the Z-fold design in the center. What is that Z formation doing in the center of a Star of David? If you look closely at those four Z-points, they represent the vertices of an invisible dodecahedron. That is the geometrical key to the entire composition of the *Stanza della Segnatura*. Those four linear Z-points define the location of an invisible underlying dodecahedron that your mind has to construct from the Star of David by unfolding it in a manner such that its features become the underlying measure of axiomatic change of this entire composition. How can the observer do that? How can the observer jump the non-linear difference between the second and third dimensions with only linear extensions of points and lines?

First and foremost, the two frescos of the *Stanza della Segnatura* are true metaphors of the principle of creativity itself; that is, of the transfinite change in both the political and poetical sense of changing. It is from that vantage point that these two frescos play a most important role for the history of the development of mankind. In other words, mankind cannot develop without such knowledge of discovery of principle of artistic composition. As LaRouche stated: "Although the sovereign individual act of creative reason is conditioned by a social context, ultimately, the primary relationship within society is a direct, as if to say

unmediated relationship between the individual person and all of past, present, and future historical existence of mankind."[10]

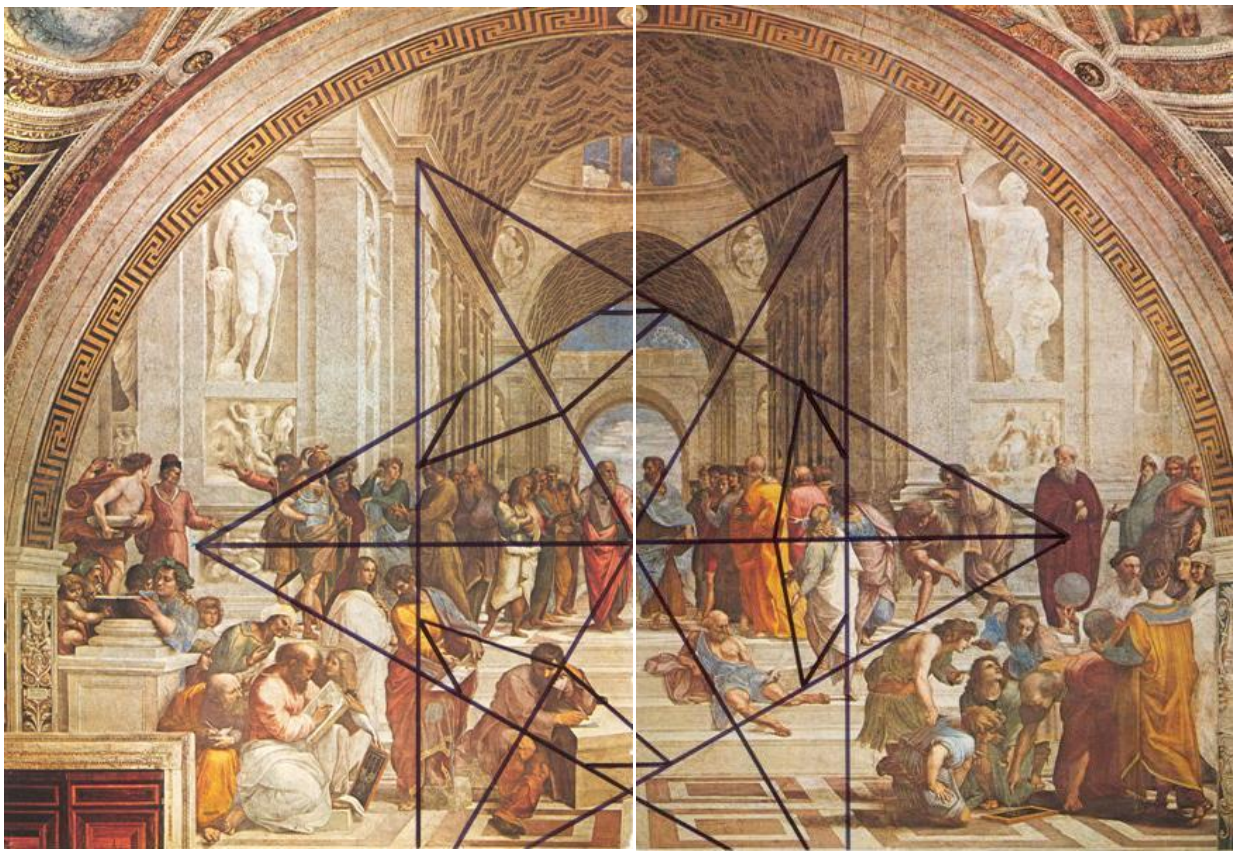


The One and the Many

The idea of the *simultaneity of eternity* can be expressed geometrically through the spherical generation of all of the Five Platonic solids and their stellations by means of Viator's method of three-point perspective as Leonardo generated them in his illustration of Pacioli's book, *De Divina Proportione*. The

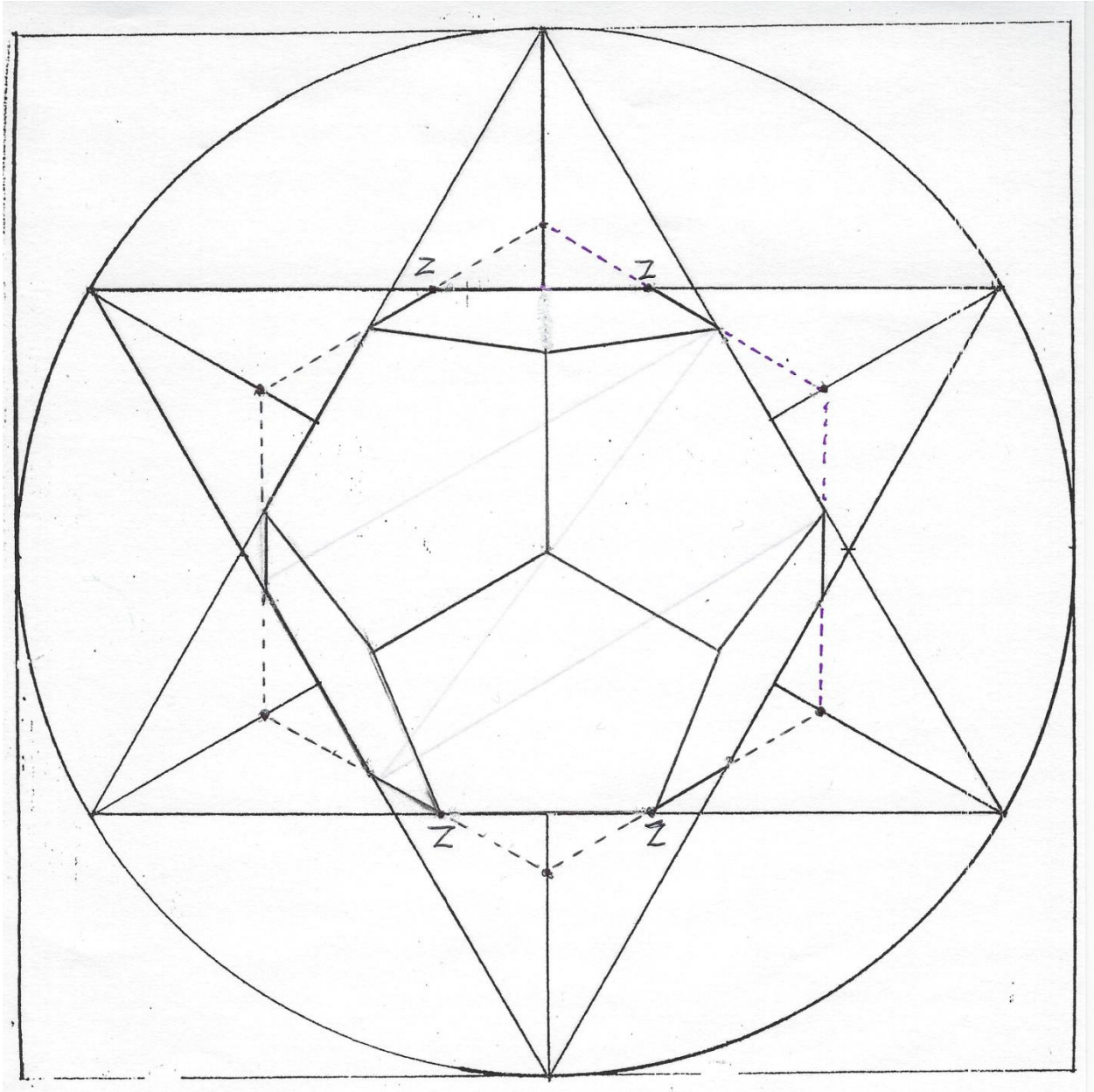
[10] Lyndon LaRouche, ***Project A***, EIR, Vo. 17, No. 41, October 26, 1990, p. 10.

closure, however, comes with the Stellated Dodecahedron and Great Dodecahedron.



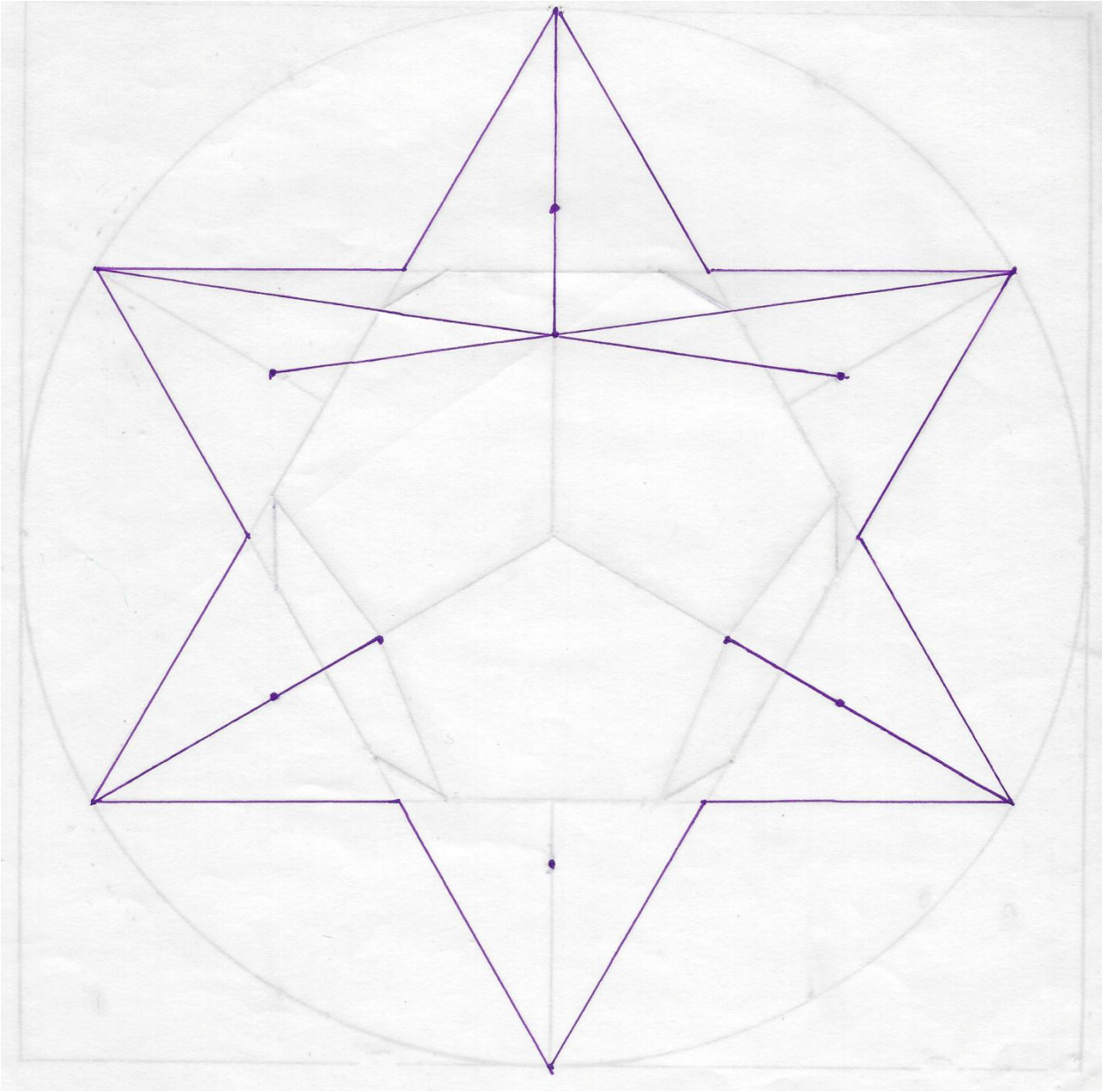
The dodecahedral framework of Bramante's architecture and floor plan for *The School of Athens*.

The above figure shows how the regular dodecahedron is generated from the Z-points of the Archimedean Star of David. Note that, at the same time, the dodecahedron is lifted from the two dimensional plane of the Star of David and is represented in the higher transfinite third dimension. Your eyes and your mind's eye capture in a single glance the essence of the discovery of going from a lower to a higher manifold.



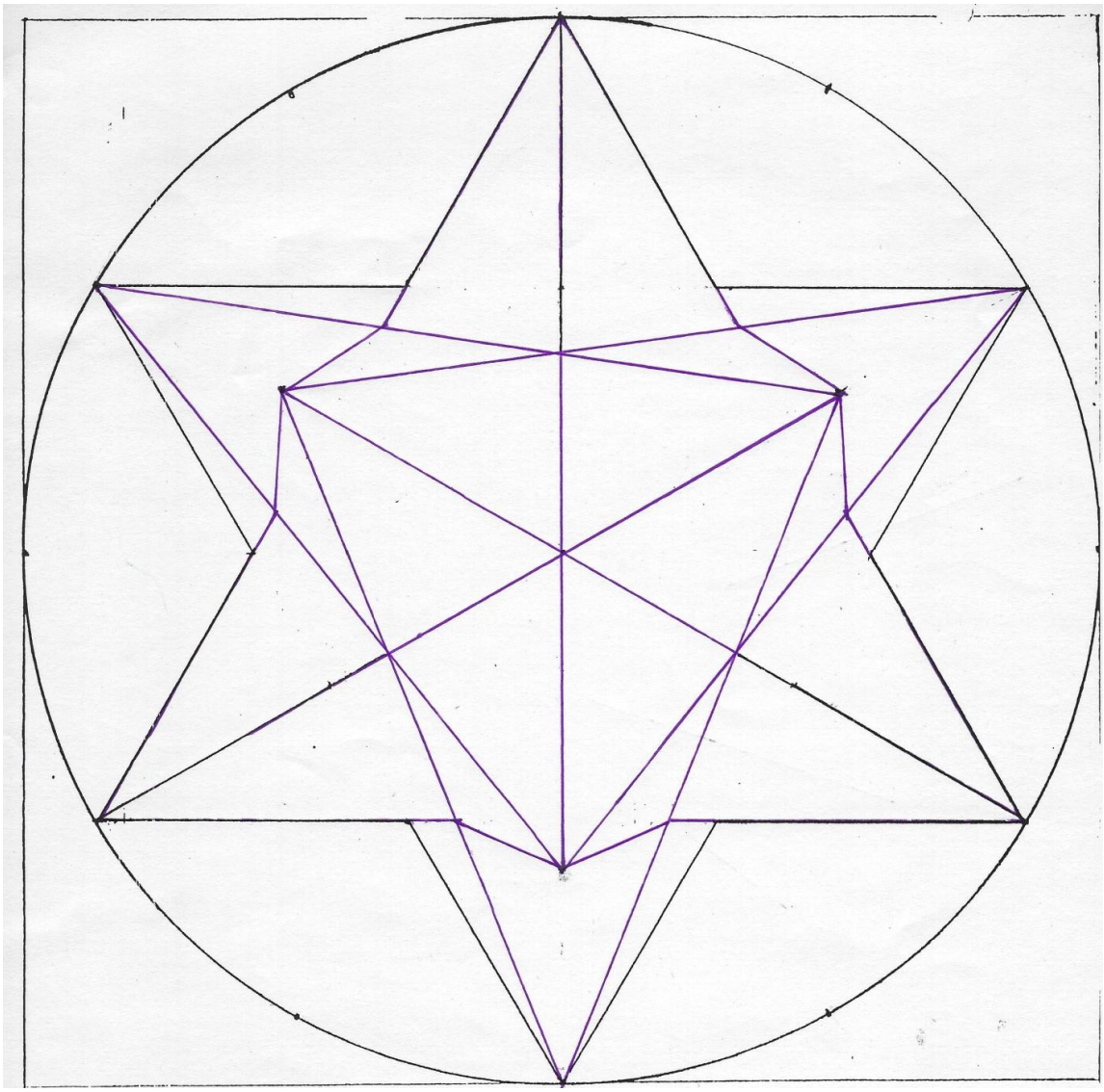
Hexagonal projection of the dodecahedron

Next, draw 6 short lines through all of the 6 pairs of Z-points and mark new points on the six radii connecting the dotted hexagon circumscribing the dodecahedron. Next, extend three radial lines to the apex of three pentagons. You have now constructed the dodecahedron, key to discovering the geometry of the starred dodecahedron. Next, trace the following elementary lines and points to complete the stellated dodecahedron.



Transformation from the regular to the stellated dodecahedron

From the apex of the six point Star of David, draw three times two crisscrossing lines joining the apex of 3 starred pentagons. You have now defined the location of the twelve apexes of a stellated dodecahedron.



Stellated dodecahedron

In those few plane to solid transformations, the observer has been able to follow, step by step, the creative process of Raphael's mind for the construction of *The School of Athens*, and can now examine how the invisible spherical dodecahedron has become the generating principle of linear perspective.

The question which may come to the reader's mind is: How can a flat hexagonal geometry be connected to the three dimensional space of the dodecahedron? First of all, how does six-sidedness (or twelve-sidedness) become mixed with five-sidedness (or ten-sidedness)? Hexagons and pentagons don't mix,

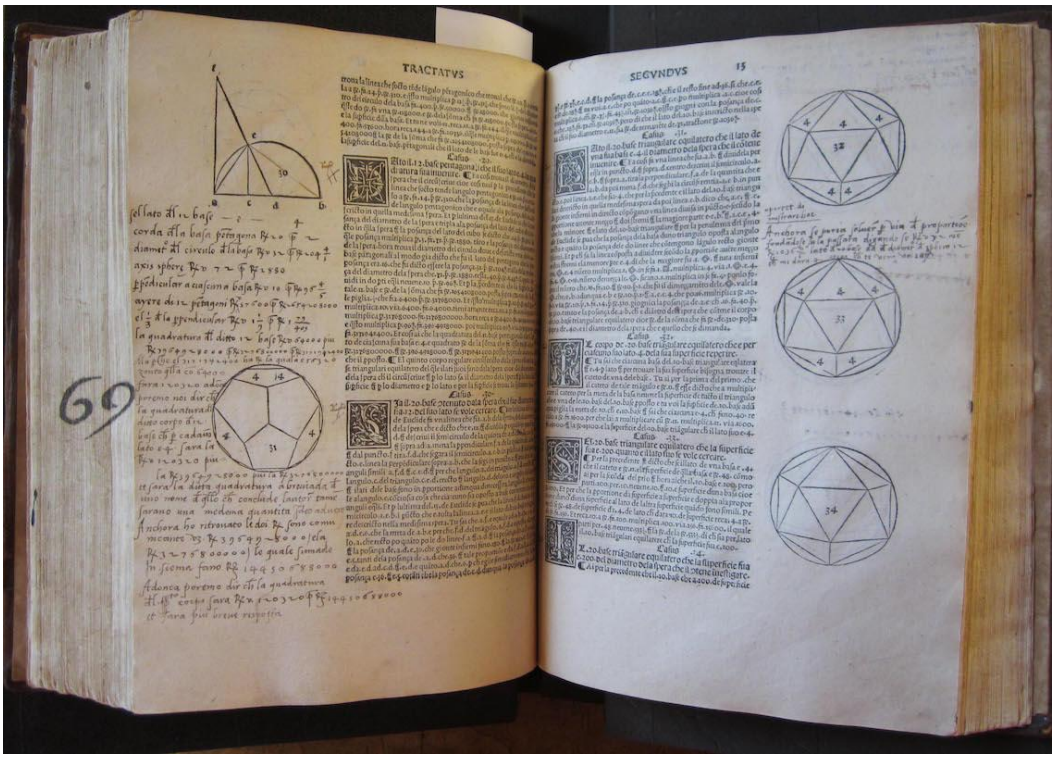
at least not in the plane. The beauty, however, is that it can be done in the higher domain of three dimensional spherics. In other words, this transformation can be conceived as an anomaly of change between the two dimensional and the three dimensional domains. To illustrate this point, you can construct a single sphere of the five Platonic solids by intersecting ten great circles partitioned into twelve parts.

The integral sphere of the five Platonic solids. Note that the 20 vertices of the dodecahedron are inserted inside of 20 hexagonal cups.

This is the geometrical and epistemological singularity that Raphael solved at the end of the Italian Renaissance with the help of Leonardo da Vinci and Luca Pacioli. Note how Raphael used the model of linear perspective projection that Leonardo drew for the construction of the dodecahedron and icosahedron in Pacioli's book on *Divine Proportion* (see the two pages of Pacioli's book below).

The geometrical key for understanding the spherical generation of such divine proportion is located in the fact that if the six-sidedness of the hexagon and the five sidedness of the pentagon are not compatible in the plane, they are perfectly compatible in the sphere. Such compatibility comes from the fact that a sphere of ten circles partitioned into twelve parts is the only sphere which can generate the five Platonic Solids.[11]

[11] The principle of construction for such a sphere can be found in my geometry book: LANTERNLAND: CONSTRUCTIVE GEOMETRY OF THE FIVE PLATONIC SOLIDS, Kindle Edition, 2018.



Folios 12v and 13r of the Bodleian copy of *De Divina Proportione* (BOD, Arch. B d.24). The spherical generation of the dodecahedron and the icosahedron through hexagonal geometry.

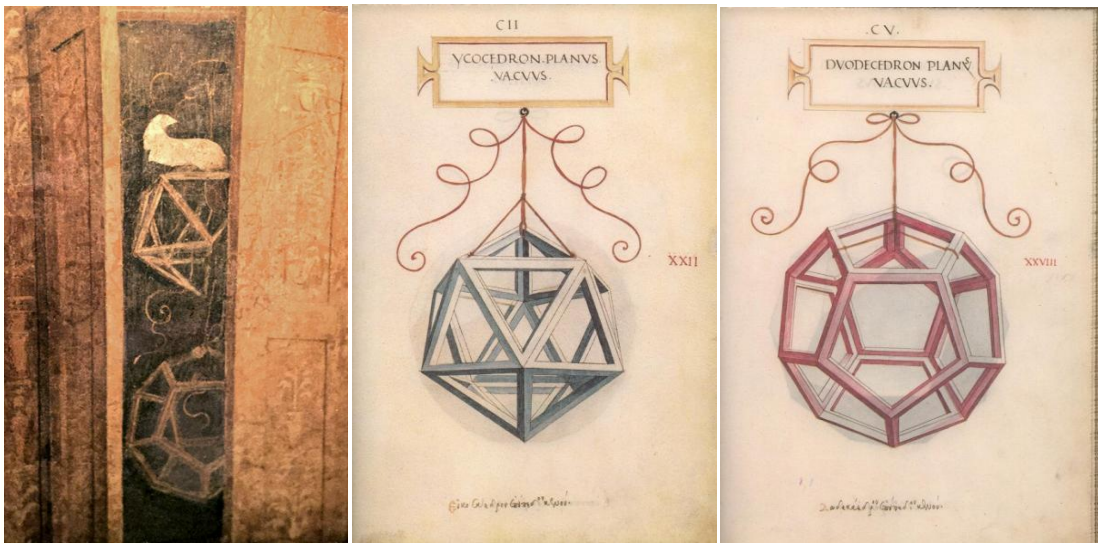
The *Divine Proportion*, known as the golden section, is a unique geometrical ordering which expresses the axiomatic change between non-living and living; that is, very simply as a geometrical proportion whereby **a : b = b : (a + b)**; and whose *self-generating inclusion* is found everywhere in the composition of the twelve dodecahedral pentagons, which, according to Plato, is the celestial generative principle of the other four Platonic Solids.[12]

Leonardo did more than collaborate with the Franciscan monk, Fra Luca Pacioli, during the last days of the fifteenth century. Both Pacioli and Leonardo were forced to leave Milan in December of 1499, because of the invasion of the duchy by the French King, Louis XII. Both geometrician and artist fled to Mantua together, then later to Venice, and finally to Florence, where they shared a house for an extended period of six years, until 1506. In 1509, the year during which

[12] I will discuss this important subject matter in an upcoming report on Plato's 'Geometrical Number' and the transfinite power of the human mind in Republic, VIII, 545c9-546d4.

Raphael started to compose the *Dispute of the Holy Sacrament* and *The School of Athens*, Pacioli returned to Venice to publish *De Divina Proportione*. Remember that Viator's *De Artificiali Perspectiva* was first published in 1505 and again in 1509. It would be very surprising that Leonardo were not aware of Viator's treatise on perspective.

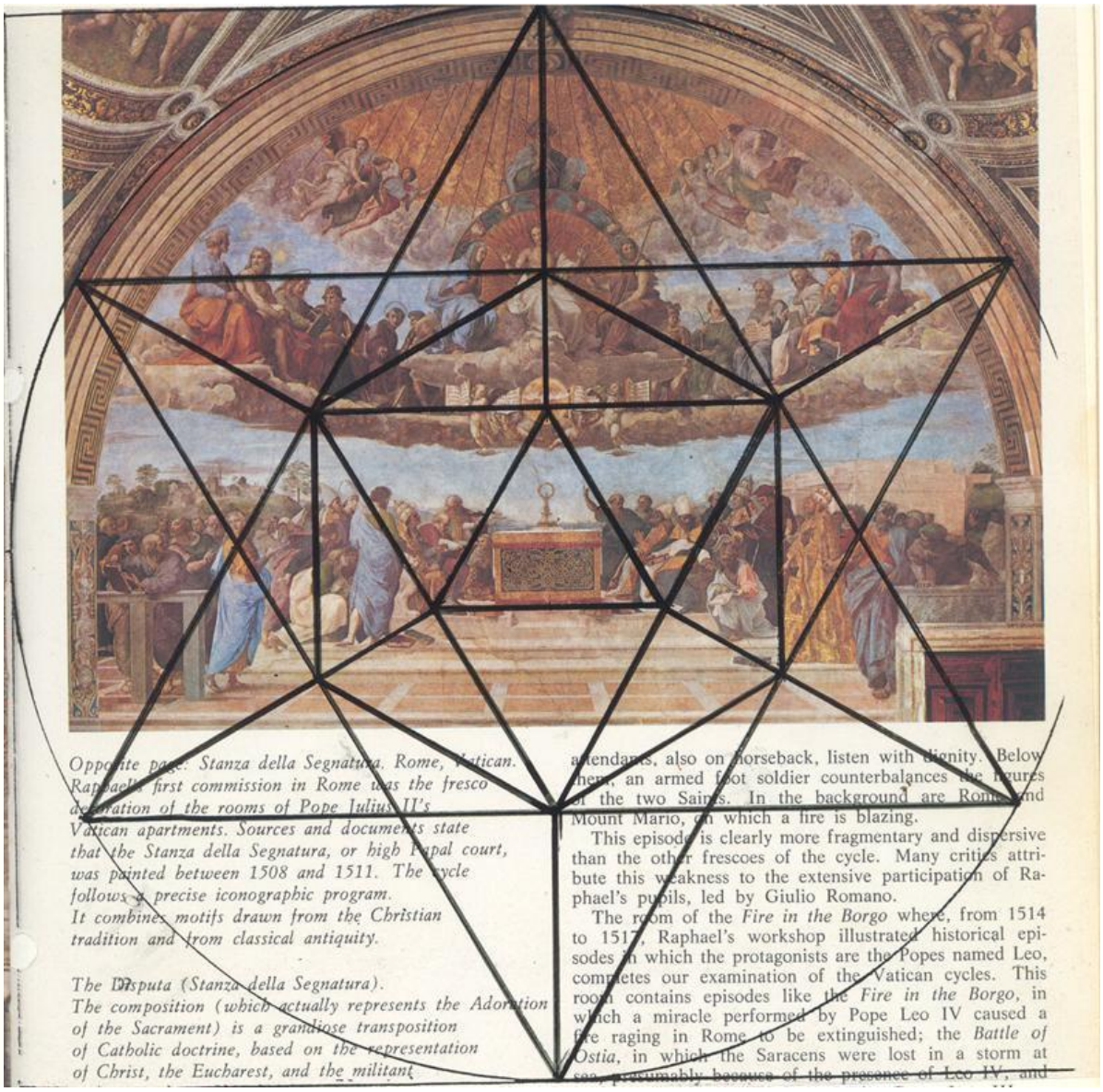
Being a close follower of Leonardo, Raphael must have had access to his illustrations for the Pacioli book and may have used these projections in his two frescos, especially since a copy of Leonardo's designs for the dodecahedron and the icosahedron appear as a trompe l'oeil wood panel located near the entrance of the *Stanza della Segnatura*.



Trompe l'oeil of two half-open cabinet doors showing reproductions of Leonardo's hanging dodecahedron and icosahedron next to the entrance door to the *Stanza della Segnatura*.
https://www.annholyoke.org/list-of-works-01-48/12-timeo-wall-piece/

Note the inscriptions of the Star of David on the floor of the *Stella*

The crucial singularity between living and non-living, between the pentagon and the hexagon, between the three dimensions and two dimensions was sufficient for Raphael to willfully decide to use the icosahedron and the dodecahedron as expressions of an axiomatic change transformation between two continuous manifolds of spatial domains.



Opposite page: Stanza della Segnatura, Rome, Vatican. Raphael's first commission in Rome was the fresco decoration of the rooms of Pope Iulius II's Vatican apartments. Sources and documents state that the Stanza della Segnatura, or high Papal court, was painted between 1508 and 1511. The cycle follows a precise iconographic program. It combines motifs drawn from the Christian tradition and from classical antiquity.

The Disputa (Stanza della Segnatura). The composition (which actually represents the Adoration of the Sacrament) is a grandiose transposition of Catholic doctrine, based on the representation of Christ, the Eucharest, and the militant

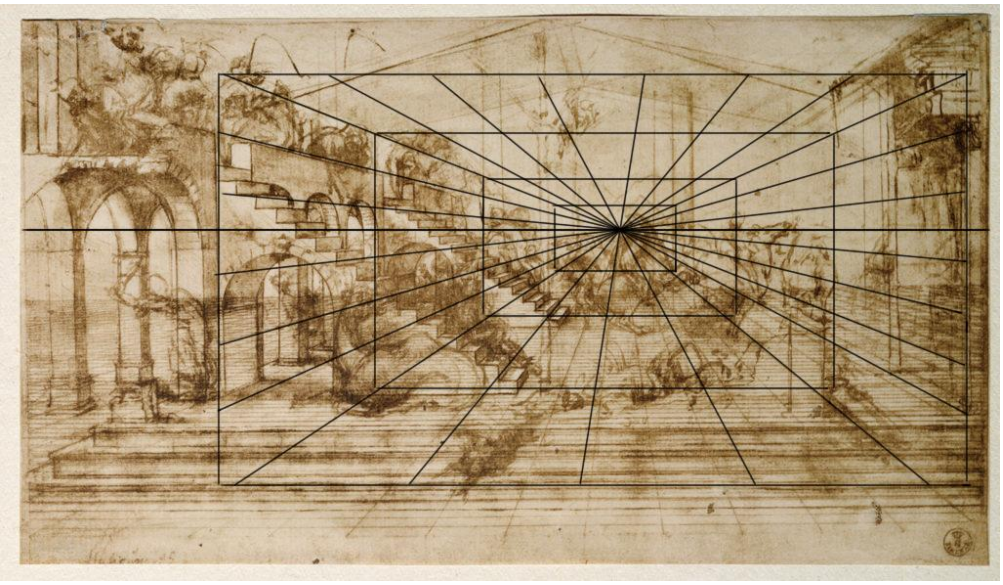
attendants, also on horseback, listen with dignity. Below them, an armed foot soldier counterbalances the figures of the two Saints. In the background are Rome and Mount Mario, on which a fire is blazing.

This episode is clearly more fragmentary and dispersive than the other frescoes of the cycle. Many critics attribute this weakness to the extensive participation of Raphael's pupils, led by Giulio Romano.

The room of the *Fire in the Borgo* where, from 1514 to 1517, Raphael's workshop illustrated historical episodes in which the protagonists are the Popes named Leo, completes our examination of the Vatican cycles. This room contains episodes like the *Fire in the Borgo*, in which a miracle performed by Pope Leo IV caused a fire raging in Rome to be extinguished; the *Battle of Ostia*, in which the Saracens were lost in a storm at sea, presumably because of the presence of Leo IV; and

The icosahedral structure of Raphael's *The Dispute of the Holy Sacrament*, 1509

LEONARDO'S SOLUTION TO THE ONE AND THE MANY



Leonardo's central perspective drawing

Leonardo's conception of light propagation with respect to the human eye is a good example of how to deal with the physical aspect of posing and solving Plato's paradox of the One and the Many in both optical physics and in artistic composition, at the same time. Leonardo's idea can also elucidate the epistemological nature of the illuminating function of the mind that Nicholas of Cusa termed "*intellectual*" as opposed to "*rational*." The question that Leonardo posed with respect to light propagation in physical-space-time is worth recasting here in epistemological terms rather than simply geometrical or physical ones. The crux of the matter can be found in the optical section of his Notebooks where he wrote:

> "If the object which is located in front of the eye sends it its image, in turn, the eye sends it its own, in such a manner that no portion of one or the other gets lost because of the eye or because of the object. We are, therefore, led to believe that the nature and the power of the luminous atmosphere attracts and accepts within itself the images of objects included in it, as opposed to having the nature of objects transmitting their images through the atmosphere.

> "If the object placed in front of the eye were to send its image to it, the eye would have to make use of reciprocity whereby the result would be that such images have to have some immaterial powers. In that case, it would have to be the case that the dimension of each object should diminish rapidly; because each body appears as an image in the air which is in front of it, that is to say, that the entire body is included in the whole atmosphere and the whole is equally included in the part, and all of the bodies are in the total atmosphere and all of them are also in each part, understanding by that the portions of the atmosphere susceptible of receiving into them the direct and radiating lines of the images transmitted by the objects. Consequently, we must admit the fact that the nature of the atmosphere in which the objects are swimming is such that it attracts to itself, as does a magnet, the images of the bodies through which they find themselves. This is the proof that all of the objects which are located in the same location are entirely included in the whole of the atmosphere as well as entirely in each of its parts:" [13]

What Leonardo is introducing, here, is the experiment of the *Camera Obsura*. Although later Netherlands artists like Vermeer used the *camera obscura* as a technique to copy subjects, the significance that Leonardo draws from the experiment is epistemological rather than practical or photographical. Leonardo's idea behind this experiment is not to prove the Euclidean hypothesis that light travels in straight lines, but rather that the spherical field of light illuminated by the sun can be replicated as many times as one desires inside of a dark room; thus, illustrating metaphorically and physically the epistemological construction of the paradox of the One and the Many. Leonardo added:

> "I maintain that if, you make a little round hole in the façade of a building in front of which there is a field illuminated by the sun, all of the illuminated objects facing that wall will project their images into the room of that building through that hole and will become visible, inside of that house, against the opposite wall which has to be white. They will all be there, but upside down; and if you make similar holes in different parts of the wall,

[13] *Les Carnets de Leonard de Vinci*, Gallimard, Paris, Vol. 1, 1942, p. 214. Translation by P. B.

> you will get the same result; that is, the images of the illuminated objects will all be reproduced in each and all of the least parts of that opposite wall. Here is why: we obviously know that such a hole must distribute light inside that house, and that the light which goes through it is caused by one or more luminous bodies; if these bodies are of different shapes and colors, the rays which compose their images will also be of various shapes and colors in accordance with the representations on the wall."[14]

The point that Leonardo is making, here, is that in the propagation of any image to the eye, there is not only the image of all of the objects placed in front of the eye; but there is also the fact that each image is totally projected in the eye as in front of a mirror; that is, totally in the whole surface of the eye and totally in each part of that surface; thus, expressing the idea of mirroring as the One and the Many.

It is now known that images, shapes, and colors will be projected through each and all of the molecules of air just as through the molecules of water, but what is less acknowledged, is the fact that the mind is also capable of projecting such images through concepts to other minds, although, by changing their shapes, color and intensity of shades, sometimes even by projecting their opposite or by making the opposites coincide. This is how paradoxes get solved and ironies are created; but this is also how lies are propagated to fool the gullible. The metaphorical allegory of Plato's Cave is a clear example of how such a process works and where images can be tested against truth. This is the reason why sense perceptions of things are never what they seem to be in and of themselves. Leonardo is emphatic, again at the end of his chapter on optics, when he says:

> "Describe how no object can be defined in itself in a mirror; but it is defined only by the eye that sees it, for if you look at your own face in the mirror, the part will resemble the whole, given that it is entirely included in the totality of the mirror and entirely in each of the parts of the same mirror;

[14] Ibidem, p. 214-215.

and the same is applicable for the image of any object in front of that mirror."[15]

RAPHAEL'S PERSPECTIVE OF GENEROSITY

As we have just seen with Plato, perspective is much more than determining the relative receding size of objects in space; it is a way to extend and restore the human mind to its divine destiny. When you apply what I call the *Raphael Perspective of Generosity* within the hexagonal-pentagonal geometry to his two frescos of the *Stella della Segnatura*, then suddenly, as if by a bolt of lightning in a clear blue sky, you are struck and shaken by an unbelievable emotion caused by a celestial dodecahedron. The question this raises is how can one go to the higher domain of the divine creative process, simply by tracing straight lines on a flat piece of paper?

You are exalted by a blinding beauty, as if a new dimension of the universe had opened up before you, a sublime soaring of noble souls, as if all of the great thinkers of known history had been assembled isochronically in the *simultaneity of eternity*, and in divine proportion, with the sentiment of generosity (*agape*). That is, the appropriate sentiment for Raphael's creative process of composition.

It was this silent and invisible dodecahedron, in a calm rotation which reflected in my mind the image of its divine origin, the entire diversity of the senses and the power of ideas becoming apparent in a unique universal principle which brought together the gravitational principle with the well-tempered musical system. The whole region was unified in Plato's ontological paradox of the One and the Many. I could barely control my emotion: I could see it, but I could not believe it.

Blinded by this sublime form, its perfect symmetry fills your soul with enthusiasm, this wonderful emotion that the Greeks translated by "divine transport", and that Pasteur had identified as the "inner God." This region was even more sublime than the Pythagorean Theorem had to offer in Plato's "geometrical number." This was Raphael's theorem of generosity resolving the paradox of the

[15] Ibidem, p. 240.

One and the Many, leading to the discovery of the crucial role played by Louis XI in the creation of the first Nation-State of Europe, that from which was measured, through Nicholas of Cusa, the perspective of Jean Pelerin Viator.

The School of Athens and *The Dispute of the Holy Sacrament* by Raphael represent the unity between faith and reason, the two domains unified into a single process of cognition by both linear perspective and ideal perspective, along the lines expressed by the Organizer of Victory, Lazare Carnot, who wrote:[16]

> "It is fitting that we say a word here about linear perspective, which is calculated mathematically, and of aerial perspective, which can only be measured by the sentiment. By comparing these two sciences, where one is sensual and the other ideal, the methodical course of one will help penetrate the mysteries of the other. We shall follow their analogies: by means of simple rapprochements, by clear examples, we shall attempt to lift the veil which envelops this mysterious part of art, and which is properly the science of the painter. […]
>
> "We shall speak of painting in general; we shall define it in its physical relationship as the art of imitating visible objects, by way of forms and colors, But, in its more elevated definition, it will also be the art of generating ideas by means of sensations, and of acting on the soul by the organ of vision. It is in this way that painting acquires its importance, that it competes with poetry, that it can, like poetry, enlighten the mind, warm the heart, excite, and nourish higher sentiments. We shall emphasize the contributions that it can bring to morality and to government; and how, in the hands of the skilled legislator, it will become a powerful means of instilling the horror of slavery, the love of the fatherland, and will lead men to virtue."[17]

What I want to demonstrate now is how this noble sentiment of Carnot, whereby one process is fertilized by the generative insights of the other applies, in

[16] See my report: **LAZARE CARNOT: ORGANIZER OF VICTORY**

[17] Excerpts from Lazare Carnot, extracted from the "Drawing" section of the teaching program for Public Works of the Ecole Polytechnique, 1794. Translated by P. B.

an exemplary way, to Raphael's frescos, *The School of Athens* and *The Dispute of the Holy Sacrament*. But, in order to see this, the reader must imagine that he is standing in the middle of the *Stanza della Segnatura*, where these frescos are located in opposition to one another, and internalize what Lyndon LaRouche identified as a crucial experiment of temporal eternity:

> "Today, whatever parent wishes to afford his child, or his nation the fullest possibility for equality of achievement, must turn to the heritage of these Christian humanist, Renaissance principles of education. It is this Platonic tradition, as reflected in Classical humanist education, which affords us, uniquely, the means for rendering intelligible "the truth about Temporal Eternity."[18]

Raphael's Theorem of Generosity is exemplary of the unifying theorem of perspective as defined above by Carnot: linear perspective, which is determined by the transcendental function of the dodecahedron and ideal perspective which is defined from the sentiment, and the ideal represented by Plato and the assembly of these great souls coming together in the *simultaneity of eternity* inside of *the Stanza della Segnatura*. Both Raphael and Carnot understood the complementarity of these linear and ideal perspectives, which, in reality, are but one.

The complementary purpose of both perspectives is to bring together linear physical proportions with the appropriate ideas that will enable the mind of the observer to discover beauty, generosity, virtuous conduct and justice, that is, everything which enables the formation of the noble character of a republican citizen. British critic, John Ruskin and his "Pre-Raphaelite" followers could not discover that the purpose of "the perfection of execution and the beauty of feature"[19] in Raphael's works was to elevate the human soul to the level of God the Creator. They simply did not see it.

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[18] Lyndon LaRouche, *Truth about Temporal Eternity*, Fidelio Magazine, Winter 1994.

[19] John Ruskin, *Lectures on Architecture and Painting*, The Project Gutenberg eBook, Edinburg, 1853. Ruskin had the following strange reaction to Raphael's work: "127. The doom of the arts of Europe went forth from that chamber [*Stanza della Segnatura*], and it was brought about in great part by the very excellencies of the man who had thus marked the commencement of decline. The perfection of execution and the beauty of feature which were attained in his works, and in those of his great contemporaries, rendered finish of execution and beauty of form the

The teaching of geometry and of the art of painting are unified to instill in the human heart sentiments which will hold in horror the exploitation of man by man, degeneration by the use of drugs and of indulging in counter-culture, as well as the bestialization of slavery. To the contrary, such a unified effort of perspective puts forward everything which elevates the human mind and which contributes to his dignity as a being created in the image of God. But, among all of these virtues advocated by Raphael, there is a single one which is primary above all, and which will stand out and define the pathway and the measure of ideal perspective; that is generosity or *agape* (love of mankind).

If the dodecahedral perspective is the measure of linear perspective, then generosity is the measure of ideal perspective, because it is generosity which is the underlying principle of all of the proportions of the soul and of the unity of extension and execution of its spiritual field. It is generosity which provides to the "attentive instinct" the art of anticipating and of managing, simultaneously, all of the certainties of the voluntarist as well as the uncertainties of the timid. Generosity is what permits the impatient to calm himself, the envious to temper his reprehensive desires, the rash to hold back patiently, the hateful or enraged to divest himself from his target, and, finally, the proud insolent to substitute beauty for his pride. This is the reason why there is no depth without perspective and there is no perspective without generosity. Such is the beauty of Raphael.

It is love of mankind which commands all of the emotions of the heart as do the slow rotations of the celestial sphere, which turns myriads of galaxies with their billions of solar systems, each within its own unique spiral orbital motion. Fate has made it possible for "the sentiment" that Carnot celebrated in his beautiful poem on enthusiasm to enter victorious into the house of the generous soul in order to become his compass, direct its rotation, and adjust its timepiece to the pulse of God's Creative Process. If the proportionality of linear perspective shows how to elevate and inspire the spirit of discovery, it is in the same proportion that generosity shall fill the hearts of those loving beings who must govern this world with beauty and justice. Whatever inspires the minds and warms the hearts with

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chief objects of all artists; and thenceforward execution was looked for rather than thought, and beauty rather than veracity."

enthusiasm shall also embrace and apply the unique and sublime perspective of generosity of Raphael.

CONCLUSION

In conclusion, it should be noted that with the creation of the three-point perspective of Viator, Leonardo, and Raphael, what we are witnessing is a reflection of the Trinity Principle where three points of convergence on a single object is a conceptual representation of the truth of Unity as in the Holy Trinity, which all three artists applied as their principle of spatial artistic composition; that is, a triply-connected unique "subjective point" (*punctus subjectus* as Viator called it) of the creator who is everywhere and nowhere at the same time, and, by generous extension, which includes the point of view of the observer. In Lilian Brion-Guerry monograph on Viator, she concludes that this discovery of principle had been the conception that Nicholas of Cusa celebrated throughout the Renaissance and which came to replace the static Aristotelian and Euclidean perception of space of the Middle-Age. Brion-Guerry identified this revolution as follows:

> "With reference to a center of the universe determining connections between its elements in a determined form of spatial relationship, the thinking process of Cusa consisted in looking for a methodology of knowledge whereby all things could be seen, '*intellectualiter*', that is to say, by accepting the penetration of the contraries, the *coincidence of opposites*, and which was able to access the intuition of Unity (as opposed to a method of knowledge by reason, '*rationaliter*', which on the contrary maintains the antagonistic principle). Within the infinite cosmos, the relative differences are nullified. According to the very words of the Cardinal of Cusa, 'God is the center of the Earth, of all of the spheres, and of everything which exists in the universe, and He is, at the same time, the infinite circumference of all things.' So much so, that each element, with respect to this divine source of

> life, finds itself 'in direct contact with God' but is also equally distant and nearby."[20]

What Cusa is saying here is not inaccessible to ordinary citizens; it's perfectly understandable. What he says is that if you don't muster all of the forces that you have inside of your mind in order to think properly as human beings should do, for the betterment of mankind, then you become a victim for anyone who tries to lure you into the illusions of sense perception. Cusa identified "*intellectualiter*" as the highest quality of the human mind; that is, as having the "mirroring power" of a "diamond tip:"

> "… As if an indivisible and most simple pointed tip of an angle of a very highly polished diamond were alive and as if in this pointed tip were reflected the forms of all things. By looking at itself this [living tip] would find the likenesses of all things; and by means of these likenesses it could make concepts of all things."[21]

And, in *De Quaerendo Deum*, 3 (43), Cusa adds that *enfolding* (*coplicatio*) ideas which is the creative power of mind, and *unfolding* (*explicatio*) of the same ideas, which is the power of explaining them , are the two ways by means of which the intellect is aroused through the divine power of fiery discovery:

> "For our intellectual spirit has within itself the power of fire. [This spirit] was sent by God to the Earth for no other purpose than to blaze and grow into a flame. It grows [inflamed] when it is aroused by wonder—as a wind blowing on a fire fans, as it were, its potentiality into actuality. And, indeed, in apprehending the works of God we marvel at Eternal Wisdom.

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[20] Lilianne Brion-Guerry, *Jean Pelerin Viator, sa place dans l'histoire de la perspective*, Société d'Edition les Belles Lettres, Paris, 1962, p.416. Translated by P. B.

[21] Nicholas of Cusa, *De Mente*, 5, (85: 15-20). in *Nicholas of Cusa on Wisdom and Knowledge*, by Jasper Hopkins, The Arthur J. Banning Press, Minneapolis, 1996, p. 22. In *The Layman: about Mind*, Cusa states: "You know the divine simplicity folds everything up in itself. Mind is an image of this enfolding simplicity. So, if you called the divine simplicity infinite mind, it will itself be an exemplar of our mind. If you call God's mind the totality of truth about things, you will call our mind the totality of assimilation of things, so that it may be a totality of ideas. For in God's mind, conception is the production of things; in our mind conception is the knowledge of things. If God's mind is absolute being, then his conceiving is the creation of beings; and human conceiving is the assimilation of beings." Nicholas of Cusa, *The Layman: about Mind*, Translated by Clyde Lee Miller, Abaris Books, New York, 1979, p. 49.

> And we are aroused by the external wind both of works and of creatures of such varied powers and operations, in order that our desire may grow into love of the Creator and [may lead us] unto an intuition of that Wisdom which miraculously ordained all things."[22]

True behavior of the human mind is to think *intellectually* as opposed to *rationally*, because the voluntarist effort of maintaining the creative level of Platonic problem solving ideas in our minds is the only way to prevent you from falling prey to the Aristotelian spectator sport of daily bombardment of sense perception. Brion-Guerry asserted correctly that it was this revolutionary transformation of the medieval Aristotelian conception of space-time which made possible the emergence of Viator's "*Perspectiva Artificiali*" and enabled his method to ultimately bring about a closer collaboration between a scientific knowledge of optics and artistic composition, especially in the Netherlands.

The point to be remembered is that the new method of three-point perspective of Raphael's *The School of Athens* leads directly to the discovery of the transfinite axiomatic transformation between the second and third dimensions that LaRouche talked about in his book *Project A*, and therefore, Raphael's perspective of generosity is uniquely able to cause an axiomatic change in the mind of the observer only under the condition that the intellect be moved in accordance with the triply-connected motion of circular action. From that standpoint, the mind of Raphael's observer is no longer the Aristotelian-Euclidean locus of accommodation to a suffocating world that the Pre-Raphaelites complained about and rejected. Raphael was able to replicate, as Leonardo did before him, not only the precise ideal relationship among the apparent size of objects is receding space, but also to replicate in the observer's mind the unique power where the creative process of the human mind is able to act on the universe and change it, as would do any consistent companion of God the Creator. **FIN**

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[22] Nicholas of Cusa, *De Quaerendo Deum*, 3 (43), in *Nicholas of Cusa on Wisdom and Knowledge*, by Jasper Hopkins, The Arthur J. Banning Press, Minneapolis, 1996, p. 22. In note 160, Hopkins added the following references by Cusa on the power of mind: "DM 5 (81:6-11): "Hence, because the mind is a 'divine seed' that conceptually enfolds within its own power the exemplars of all things, it is at once placed by God … in a suitable earthen body, where it can bear fruit and can unfold from itself, conceptually, an all-encompassing unity of things" (p. 74)