ON THE PRINCIPLE OF LYNDON LAROUCHE'S HIGHER HYPOTHESIS

Including Plato, Leonardo da Vinci, Gottfried Leibniz, and Ludwig van Beethoven.

by Pierre Beaudry, 3/24/2022

FOREWORD

Throughout the entire span of his dialogues, Plato skillfully placed a unique and crucial moment of discovery of principle through which he showed how the mind is able to reach a higher level of creativity, beyond anything it was able to do before. He didn't do it with a lot of fanfare and fireworks. He did it by taking one step back and two steps forward and called this axiomatic experience of discovery of principle an instantaneous [***exaiphnēs*** (*ἐξαίφνης*)] moment of eternity.[1]

This exceptional moment of discovery is fundamentally related to experiencing an axiomatic change that takes place inside of your mind whenever a sharp and sudden [***exaiphnēs*** (*ἐξαίφνης*)] change occurs in your life, producing an unexpected transition to a new, higher, and better manifold of understanding and of thinking, which generally appears as a sudden change of going from a state of perplexity to a state of joyful laughter.

This extraordinary "instant" causes a release of tension which goes through the mind of the discoverer by elevating it as Bel Kaufman's Yiddish joke does when you suddenly discover who or what is not there:

> "So somewhere in Russia, a man walks into a bar every day at three and orders two glasses of vodka. Eventually, the bartender asks, 'Why not just order a double?' The man explains that he has a dear friend in

---

[1] See my report: **PLATO'S_EXAIPHNĒS_MEASURING_AXIOMATIC_CHANGES**.

Kamchatka, and each orders a drink for himself plus a drink for the other, and in that way they stay close though they are far apart. Then one day, the man walks in and orders just one vodka. The bartender says, 'I fear that something has happened to your dear friend.'

'No, no!' the man replies. 'It's just that I've quit drinking.'"[2]

The attention and treatment that Plato gives to his revolutionary concept of unexpected instantaneousness [**exaiphnēs** (ἐξαίφνης)] in *Parmenides, Republic VII*, *Letter Seven*, and *Laws,* warrants that it be considered as being of the same nature as this Bel Kaufman joke, or, as Lyndon LaRouche's idea of discovering the higher hypothesis of the transfinite domain.

However, the only way to know if the universe will respond in kind to this kind of axiomatic moment is if such a moment of discovery can be generalized simultaneously throughout the planet in the near future; that is, when a universal axiomatic moment of truth, which is expected to take place for all to experience and for the benefit of all of mankind for the first time since the Italian Renaissance.

The point, however, is that such a moment will only become consciously beneficial to mankind as a whole if this Platonic idea were to be used universally in the manner that Lyndon LaRouche expressed it; that is, by *hypothesizing a higher hypothesis* for solving the present world strategic situation.

The four main *hypotheses* I propose to study for discovering such a Platonic *higher hypothesis* is a quadratic reciprocity of four discoveries of principle found in Plato, Leonardo da Vinci, Gottfried Leibniz, and Ludwig van Beethoven. The timing for such a *quadratic monad* can only take place in what Lyndon LaRouche identified as the simultaneity of "*temporal eternity*."[3]

---

[2]Bel Kaufman, *Cracking Wise*: https://magazine.columbia.edu/article/cracking-wise

[3] Lyndon H. LaRouche, Jr., *__The Truth About Temporal Eternity__*, *Fidelio,* Vol. III, No. 2, Summer 1994.

INTRODUCTION: THE PRESENTLY REQUIRED HISTORICAL QUADRATIC MATTER OF PRINCIPLE TO WATCH FOR

> *"War is a massacre among people who do not know each other, for the benefit of people who know each other but who do not kill each other."* Paul Valéry

When Lyndon LaRouche called for the establishment of a four power agreement among Russia, China, India, and the United States, the purpose was not merely to generate a new security and economic architecture among these four nations; it was also for the purpose of causing a complete axiomatic transformation of the world strategic situation by instituting a new higher principle based on the common aims of mankind.

What the current world strategic situation calls for, in the immediate future ahead, is the establishment by *The Schiller Institute* and *The LaRouche Organization* (*TLO*) of a quadratic peace coordinating body among, at least, Russia, China, India, and the United States, based on such a higher hypothesis of *temporal eternity*, which should include, minimally, a new Confucian, Muslim, Hindu, and Christian ecumenical principle of human understanding and governance. In other words, the differences among those four countries must have something in common which should be used to hold the whole of mankind together as a One over the Many different peoples, for all of the Earth's peoples, and for all times to come.

When the world goes into a strategic crisis, as is the case today, the indications are that the time is ripe for such a dramatic change in the international security boundary conditions, because the entire human population is ready for it. The problem, however, is to identify which boundary conditions should be changed first in order to find the common denominator between and among those four powers, and achieve a common purpose for all of mankind. That boundary condition to be changed is nothing else but corruption. President Vladimir Putin recently identified that first boundary condition when he declared:

"There is no independent judiciary in Ukraine. The Kiev authorities, at the West's demand, delegated the priority right to select members of the supreme judicial bodies, the Council of Justice and the High Qualifications Commission of Judges, to international organizations.

"In addition, the United States directly controls the National Agency on Corruption Prevention, the National Anti-Corruption Bureau, the Specialized Anti-Corruption Prosecutor's Office and the High Anti-Corruption Court. All this is done under the noble pretext of invigorating efforts against corruption. All right, but where are the results? Corruption is flourishing like never before.

"Are the Ukrainian people aware that this is how their country is managed? Do they realize that their country has turned not even into a political or economic protectorate but has been reduced to a colony with a puppet regime? The State was privatized. As a result, the government, which designates itself as the 'power of patriots' no longer acts in a national capacity and consistently pushes Ukraine towards losing its sovereignty."[4]

What is President Joe Biden's response to this, especially since in the morning of February 24, 2022, it was reported from Putin's office that Russia had launched an attack on all of the air bases of Ukraine in order to begin a denazification of the country? What sort of reciprocity should be expected to take place in the West?

---

[4] President Vladimir Putin, Address by the President of the Russian Federation, February 21, 2022, The Kremlin, Moscow.

CHANGING THE PAST AND THE FUTURE IN *TEMPORAL ETERNITY*

The act of changing the past into what it should have been is a special state of an **exaiphnēs** (ἐξαίφνης) moment that Lyndon LaRouche identified as *an act of transfinite becoming in temporal eternity*. What is implied by this is an act of discovering the means of restoring or reinforcing a change that some thinker made at some time during past history, say 1914 for instance, which enables you to change the past of that thinker's power in the future for the benefit of all of mankind. Such an intervention in a paradoxical *timeless time* moment has the power to secure an axiomatic change and validate it for all time to come. Lyndon LaRouche identified this as an act of "*temporal eternity*," a special form of instantaneousness **exaiphnēs**, which Plato had identified as an exceptional sort of discovery which is valid for any time past, present, and future of human history.

Recently, Mike Billington reminded me of such an action when he recalled that the Confucian philosopher, Zhu Xi, had made a powerful axiomatic discovery by adding a missing line at the end of the Great Learning of Confucius and Mencius. Mike wrote:

"One of Zhu's greatest feats was his 'discovery' of a 'missing line' at the end of the Great Learning, where he said the line after 'extending knowledge to the utmost' was: 'Extending knowledge to the utmost lies in fully apprehending the principle in things,' which means understanding the (monad-type) relationship of the particular thing to the development of the universe as a whole (the individual li and the Universal Li)."[5]

This is what an action of "*temporal eternity*" has the power to do, and this is the sudden instantaneous [**exaiphnēs** (ἐξαίφνης)] moment of coincidence of opposites that Plato defined as a higher hypothesis in his *Parmenides* (155c4-156e5). The restoration by Zhu XI of such a principle to the effort of "extending knowledge to the utmost" caused major historical transformations for centuries throughout China, and its beneficent effects are still continuing to to have their effects today. Lyndon LaRouche taught us to rediscover such moments of history

---

[5] Michael Billington, *The European 'Enlightenment' & The Middle Kingdom*, The Schiller Institute, reprinted from FIDELIO Magazine, Vol. IV, No. 2, Summer 1995.

with the idea of *transfinite becoming*; that is, by connecting human "*temporal eternity*" with the Good as the Absolute. LaRouche stated:

> "This Becoming, or generalized transfinite corresponds to the highest possible ontological significance of physical space-time, as does Cantor's generalized transfinite. This, generalized, corresponds to what this writer chooses to identify, descriptively, as '*temporal eternity*.' That descriptive term, *temporal eternity*, is required to distinguish a transfinite notion of 'eternity' from the 'timeless absolute' of the Good.

> "That Good, or Absolute, is defined by hypothesizing the generalized 'hypothesis of the higher hypothesis.' The resulting conception can be nothing but the bounding of *temporal eternity* by an intelligent, timeless Absolute which is efficiently coincident at each moment, in each place, with all moments and places of all *temporal eternity*: *The Absolute One, the Good.*"[6]

What is this "transfinite becoming"? LaRouche answers this question by constructing an experiment which indicates a scaling value of steps which take us to higher and higher manifold transitions, from entropic to anti-entropic powers, and from anti-entropic to higher anti-entropic powers, similar to the increasing powers of primitive roots in number theory, but which apply to the increasing powers of the human mind in general as opposed to numbers. This poses the following questions: how does one discover such a higher hypothesis? What are the boundary conditions of *temporal eternity* inside of the human mind, which permit such a change, and how different are these changes at their different levels? Furthermore, how do these steps express themselves in a state of becoming? Can one forecast their coming existence?

The hypothesis I propose to investigate in this respect can be called a *quadratic memory function* which includes four different discoveries of principle made by four different historical figures who lived during four very different periods of history, but who have made a common commitment to understanding the transcendental function of the Absolute Good, as their predecessors did. Those

---

[6] Lyndon LaRouche, *__The Truth About Temporal Eternity__*, *Fidelio,* Vol. III, No. 2, Summer 1994.

four historical figures are: Plato, Leonardo da Vinci, Gottfried Leibniz, and Ludwig van Beethoven. Their respective writings for this purpose are Plato's *Parmenides*, Leonardo's *Sala delle Asse*, Leibniz's *Monad of Analysis Situs*, and Beethoven's Piano *Sonata quasi una fantasia* Opus 27, No. 2.

The first consideration to be made is how Leonardo da Vinci's solution to Cusa's quadrature of the circle applies in the large as in the small, but never as deductive linearity in the small. The second consideration is to apply Plato's sudden instant (*exaiphnēs*) of axiomatic transformation between two manifolds to the One over the Many, instantaneously with each of the four mentioned discoveries of principle. The third requirement is to understand how to identify the Leibnizian monad of *analysis situs* to number theory. And, the fourth and last required boundary condition is the musical Lydian principle of transformation that LaRouche identified as a transfinite Lydian ordering principle of *temporal eternity* encompassing Bach, Mozart, Beethoven, and others. There may not be any short cuts to such a successful discovery, but there are fine musical examples to express such a sublime moment of discovery. Listen, for instance, to Marian Anderson's **[They Crucified My Lord](#)**.

REMEMBER THE BIQUADRATIC MEMORY FUNCTION

Three years ago, I wrote a paper on the discovery of principle of Lyndon LaRouche's four power solution and the principle of reciprocity which united Fuxi, Leibniz, Bach, and LaRouche within a typical form of memory function.[7]

I reported at the time on how the double memory function I was using from Henri Bergson was able to change the past from the future through long term cycles of physical space-time, provided time was no longer considered as clock-time, but from the vantage point of LaRouche's *simultaneity of physical eternity*. The best domain to look into for discovering such pre-established harmony is in Leibniz's *analysis situs* of whole numbers. The heuristic example I chose then came from number theory using 4 as a biquadratic residue of 17. I reported then:

---

[7]Pierre Beaudry, **[FUXI, LEIBNIZ, BACH, AND LAROUCHE ON THE PRINCIPLE OF RECIPROCITY](#)**.

"In the case I wish to present to you, the four biquadratics and principles are the following: The first (1) is the repetitive application of the musical Lydian spirals originally discovered by J. S. Bach. The second (4) is the rediscovery of how to increase energy-flux-density as identified by Lyndon LaRouche. The third (16) is the rediscovery of the underlying circular geometry of whole numbers made by Poinsot and Gauss, in the spirit of Beltrami's geometrical construction of negative curvature. And the fourth (13) is the rediscovery of the Geometry of the Binary function discovered by Fuxi and Leibniz in accordance with Cusa's method of coincidence of opposites.

"With the help of those four principles, find the appropriate geometrical placement of 4 as a biquadratic residue of 17. (See Illustration below) Starting at 1 and moving in an ascending motion clockwise, if you increase the value of the poloidal action 4 by any power whatsoever with respect to the toroidal action 17, the multiple poloidal wave unit of action of 4 will continuously increase and connect together by least action all four biquadratic residues of 17; that is, starting from 1 to 4, 4 to 16, 16 to 13, and 13 back to 1. All empty spaces will be covered in accordance with a definite set of quadratic rules."

"Thus, it does not matter how many powers you use in order to orbit around the torus, your biquadratic placement (the ordering of physical space-time) will always be secured under those four principles; and those four primary principles will always secure your other secondary discoveries inside the monad of your mind. As Leibniz established in his *analysis situs* game, 'all of the spaces on a board are to be filled according to definite rules.'[8] The question is: What is the ordering principle behind those rules?"[9]

---

[8] Gottfried Wilhelm Leibniz, **Philosophical Papers and Letters**, Ed. Leroy E. Loemker, Kluwer Academic Publishers, Boston, 1989, p.487.
[9] Pierre Beaudry, *FUXI, LEIBNIZ, BACH, AND LAROUCHE ON THE PRINCIPLE OF RECIPROCITY*, p. 5-6.
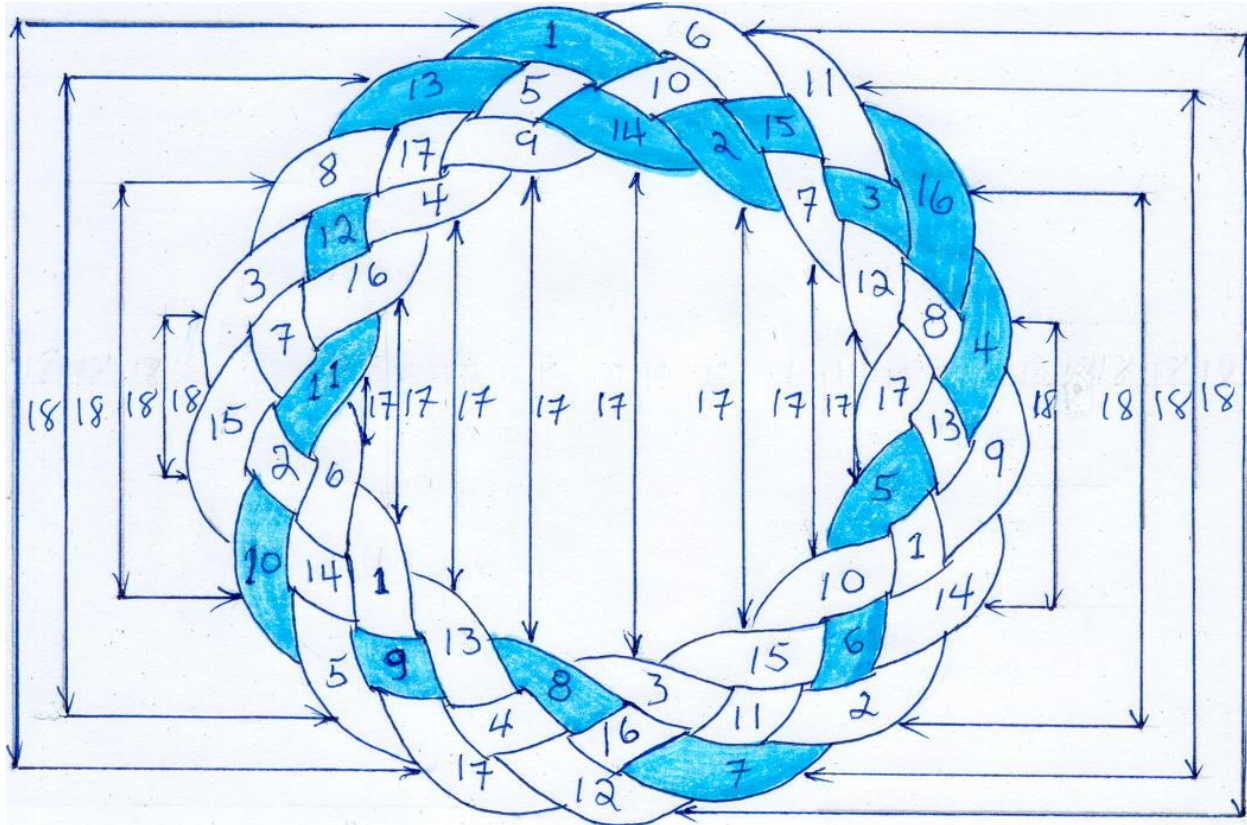
The vertical condition for biquadratic residue reciprocity. Memory-function of a modular wave in the P/T ratio of 4/17 (4 mod. 17).

PLATO'S IDEA OF A SUDDEN INSTANT *EXAIPHNĒS* OF TRANSFORMATION

Plato identified the unique moment of discovery of principle as a sudden instant (*exaiphnēs*) of transformation, which means both the assimilation of a higher discovery of principle and the founding moment of a new One over the Many.

This hypothesis demonstrates three crucial aspects of Plato's theory of ideas: 1) There is a living participation of ideas which resides in the memory of *temporal eternity*; that is, which demonstrates that ideas cannot exist as isolated units by themselves, separated from each other, as if each idea existed only in their own space and time, such as an object of Aristotelian deductive logic; 2) the interactions among those ideas act to change each others' respective boundary

conditions; 3) the sudden instant *exaiphnēs,* which brings them together, has the power to create a new higher mnemonic transfinite hypothesis with new boundary conditions.

Recall the third hypothesis of Plato's *Parmenides* which shows how all true ideas are not only interrelated and participate with each other in shaping the human mind, but that they all act to change each other in order to create a new and higher power of change for the future. Plato stated:

"Will the One not be in some strange state at the moment it changes?

"Which strange state is that?

"An unexpected instantaneousness (*exaiphnēs - ἐξάιφνης*). That is, in fact, what seems to be the meaning of suddenness (*exaiphnēs - ἐξάιφνης*); that is, a sudden starting point between two inversed states of changing directionalities. Because it is not from the non-moving immobility that change is able to surge; nor is it from the motion moved by the transition of the change. It is rather in the strange nature of the instantaneousness (*exaiphnēs - ἐξάιφνης*), an inbetweenness which, located outside of time in the interval between mobility and immobility, is precisely and simultaneously the point of departure and the point of arrival for the change which passes from mobility to rest and from rest to mobility.

"That has every chance to be true.

"Thus, since the One is both in an immobile state and in motion, it will have to change in order to go from one state to the other: it is only under this condition, in fact, that it can compose with both states. That is, this operation of change can only take place in a sudden instantaneousness (*exaiphnēs - ἐξάιφνης*); and while it changes, it cannot partake of any moment of chronological time, no more than it could be moved or be unmoving." [*Parmenides* (155d1-156e11) P. B. translation]

Thus, by signifying the emergence of such a transfinite event, the idea of *exaiphnēs* becomes a marker for the idea of a higher transfinite truth in the history

of ideas, and an idea whose time had come during Plato's time, but whose universal application had not been recognized with the full contradictory effect that it had created until now, with the transfinite idea of LaRouche's *temporal eternity* and during the extended current crisis of democracy, worldwide. Here again, Plato speaks clearly to our present day citizens about such a sudden moment of undecided political perplexity, as it pertained to Sparta during his time.

In *Laws, Book III*, as in *Parmenides*, Plato locates the experience of a sudden instant (**exaiphnēs**) of perplexity which is posed by the political system of Sparta and its governing principle; that is, the idea of a contradictory state of "dictatorial democracy." Here is how the Spartan citizen, Megillus responded to the question about the political system of his homeland:

> "As a matter of fact, when I consider the political system of Sparta, sir, I find it impossible to give you a straight answer: I just can't say what one ought to call it. You see, it really does look to me like a dictatorship (it has the ephors, a remarkably dictatorial institution), yet sometimes I think it is more democratic that all other cities I know. But then again, it would be wrong not to also call it an aristocracy; and finally, it also has monarchy (held for life), which both we and the rest of the world speak of as the oldest kingship of all. So, when I'm asked unexpectedly (ἐξαίφνης) like this, the fact is, as I said, that I can't distinguish exactly which of these political systems it belongs to." Plato, [*Laws*, 712d2-e5].

Here is a beautiful and unique moment of *temporal eternity* where Plato, tongue in cheek, reveals the *timeless suddenness* of the paradoxical truth concerning democracy as being a child of dictatorship. Ultimately, democracy is nothing else but an "unsuspected" dictatorship; and the echo of ancient Sparta suddenly rings like a clarion wakeup call all over the world, today, warning about America becoming the dictatorial democratic policeman of the world. Is this not the role of Plato's timeless memory function of a sudden instant *exaiphnēs* of truth in *temporal eternity*? When asked to clarify such an ambiguous situation, the

Athenian responded by demonstrating that Greek citizens were "wonderfully happy" when they used to lived in the age of Cronus.[10] The Athenian added:

> "Well, the god, in his kindness to man, did the same; he set over us this superior race of spirits [race of golden souls (δαίμων)] who took charge of us with no less ease to themselves than convenience to us, providing us with peace and mercy, sound law and unscanted justice, and endowing the families of mankind with internal concord and happiness. So, the story teaches us today, and teaches us truly, that when a community is ruled not by God but by man, its members have no refuge from evil and misery. We should do our utmost – this is the moral – to reproduce the life of the age of Cronus, and therefore should order our private households and our public societies alike in obedience to the immortal element within us, giving the name of law to this reasonable dispensation." (*Laws*, 713d4-714a3.)

In other words, the "spirits" of the golden souls are governed by the power of immortality; that is, by the immortal courage of a Promethean action that is based on the higher principle of the Good. There is, however, an unexpected result which is that the suddenness of the moment of discovery could always go into two completely different directions; it could express a joyous moment of hope and optimism, or it could be a fearful moment of despair and pessimism. The example of murder with premeditation is a case in point. When the Athenian examines the distinction between calculated murder and killing in the spur of the moment, he has compassion for those who are overtaken by a sudden unthinking action:

> "We should lay down comparatively severe penalties for those who have killed in anger and with premeditation, and lighter ones for those who have killed on the spur of the moment (**exaiphnēs**) without previous intent.

---

[10] In Greek mythology, Cronus, son of Uranus (heaven) and of Gaea (Earth), was defeated by his son, Zeus, and his banishment ended his ruling as a Greek god. Cronus is usually represented as an old man leaning on a Scythe and holding an hourglass in his hand, biding his time until the moment comes when he is able to come back again. The race of "spirits" is also described as the first "golden race" of mortal men by Hesiod: "First of all [110] the deathless gods who dwell on Olympus made a golden race of mortal men who lived in the time of Cronos when he was reigning in heaven. And they lived like gods [115] without sorrow of heart, remote and free from toil and grief: miserable age rested not on them; but with legs and arms never failing they made merry with feasting beyond the reach of all evils." (**Works and Days**, 110-115).

Something which resembles a greater evil should attract a greater punishment, whereas a lesser penalty should be visited on that which resembles a lesser evil. This, then, is the course our laws should take." (Plato, *Laws*, 867bc).

One can include Malthusianism and war, which are murder of the world's population by premeditation.

Even though the flash of discovery reveals a moment of conscious insight, like an afterthought, which may have been prepared by a long period of training in the discipline of philosophy and of political organizing, the sudden instant (***exaiphnēs***) of revelation itself is an unexpected and unthinking moment of experience which comes upon us as if from higher up; therefore, Plato estimates, as he said in *Letter Seven*, that "it is not something which can be put into words like other sciences." (*Letter Seven*, 341c7-8).

For Plato, it is clear that such an instant is not affected by any form of chronological time. It is not short nor is it long; it belongs to a time of discovery of principle which has a universal and immortal value attached to it and it cannot be stamped out under any form of amnesia. Christians will recognize such an event as a transformation of the soul similar to the one that St. Paul experienced on the road to Damascus (Acts 9:3 and 22:6). It is a revealing moment of truth whose instantaneous effect of transformation leaves you in suspense, outside of chronological time, as if in some state of inbetweenness, which is neither motion nor rest, neither beginning nor ending, neither present nor past, but both, which is at the same time everywhere universal and eternal which pertains to a type of change that can never be undone; such as the one that LaRouche identified, for example, with the birth of the sovereign nation-state from natural law. As LaRouche stated:

"It was this coincidence of natural law with both the new notion of a sovereign nation-state republic, and a consistent notion of physical science, which has caused the increase of the total human population from the several hundred millions maximum of times prior to 1400, to over five billions

today, and potentially to a technologically-determined, and rising level of more than twenty-five billions.

"The natural principle which was responsible for this sudden upward turn was not new. That ancient principle, called into play to produce this Renaissance effect, is that characteristic of the individual person which has always set the human species absolutely apart from, and above all other known creatures existing within *Temporal Eternity*."[11]

It is this principle of nation-state which is in a crisis today and which must be recovered worldwide in order to secure the common aims of mankind and for all time to come. The instantaneous connection between the nation-state, world citizenry, epistemology and physics, may best be expressed with the idea of experiencing the idea of *Imago Viva Dei*; that is, the creative potential (*posse ipsum*) of generating new ideas for the benefit of mankind which LaRouche associated with the discovery of the law of increasing the rate of relative population density.

The association of such an instantaneousness (***exaiphnēs***) with eternity has everything to do with the future of mankind; that is, with the future as derived from eternity as the final cause of the generative process of growth in the universe. Since time itself is essentially future oriented, it is not the past which determines that moment coming from the future, but the *temporal eternity* of human creative thinking in *Imago Viva Dei,* which pulls mankind to its ultimate destination of changing the past into what it should have been, and whose time has now come. Such a *temporal eternity* could only be consistent with a New Peace of Westphalia; that is, a moment whose time has come to end all wars on this planet. In summation, I recently reported the relevant point as follows:

"Power never smashes itself in anger on the reef of righteousness. Power is *agap*ē, the love of God and humanity. As the Apostle Paul demonstrated in his Letter to the Corinthians I, 13, *agap*ē is generous and never envious; it is never righteous nor vengeful; it is patient and always merciful and forgives easily. *Agapē* gives and never takes. Because of all of

---

[11] Lyndon LaRouche, *__The Truth About Temporal Eternity__*, *Fidelio,* Vol. III, No. 2, Summer 1994.

these qualities of leadership, *agapē* has no place of its own, and has no need of one, because it builds its home and takes its residence in others, as others take their happiness and rest in it. It is for these reasons that the power of the Peace of Westphalia is able to endure the rages of others, and it never traffics with them for some popularity. Thus, the secret of this Peace of Westphalia is to internalize, ahead of time, what other people are thinking, or are afraid of thinking, about themselves and their fellow man, and give them the benefit of the doubt."[12]

THE PEACE OF WESTPHALIA AND LEIBNIZ'S MONAD OF *ANALYSIS SITUS*

Let's look at the opposition between odd and even numbers as a heuristic pedagogical example of unity which could take place under a New Peace of Westphalia agreement between the East and the West. The unity of composition of such opposite numbers appears to be totally irreconcilable, and it seems impossible to find anything that could unite them together into a higher order. However, that impression is merely an appearance.

Leibniz noted that if you add together any sequence of continuous odd numbers, their total will always be a square number, odd or even, a unity of opposites. For instance **1+3 = 4; 1+3+5 = 9; 1+3+5+7 = 16; 1+3+5+7+9 = 25, etc.** That association brings unity to the opposition between even and odd numbers such that it can only be expressed through a change from a higher manifold. What is the higher manifold principle behind that change? An example of it is the Leibnizian *analysis situs* geometry that Louis Poinsot discovered by raising the two dimensional domain of plane numbers to the three dimensional domain of cubic primitive roots in numbers theory. What is the geometry of primitive root numbers? Although Euler denied the existence of such a geometrical possibility, Poinsot demonstrated the opposite.

On July 24, 1809, Louis Poinsot (1777-1859) introduced in the first lecture he gave at the Paris Science Institute, the Leibnizian method of *analysis situs*, for

---

[12] Pierre Beaudry, *The Economic Policy that Made the Peace of Westphalia*, EIR, Vol. 49, No. 10, March 11, 2022, p. 31.

the purpose of proving the geometrical properties of numbers on a solid epistemological foundation. This axiom busting form of playful geometry was characterized by Poinsot as a form of constructive geometry that excluded the Euclidean flat earth types of reductionist formal geometry taught in European schools at the time. He used Leibniz's *analysis situs* because it represented a playful hide and seek game of numbers in which there is a hidden epistemology which reveals the secret of how the game is played only to those who play it; that is, exactly the opposite of the mathemagic of Isaac Newton. In his opening statement to that class, Poinsot quoted Leibniz directly on *analysis situs*:

> "The object of geometry of situation (analysis situs), as I have said, is to determine the order and the location of objects in space, without any consideration for the size and continuity of figures; such that the part of mathematical analysis, which would naturally apply to it, is the science of the properties of numbers or indeterminate analysis, as ordinary analysis is applied naturally to determined problems of geometry, and the differential calculus is applied to the theory of curves, wherever the curvature changes with imperceptible nuances. I have not found the place in the Acta of Leipzig, where Leibniz talked about the geometry of situation; but it seems to me that the idea he had of it conformed with the one I am giving here, and this is what can be seen quite clearly in this section of one of his letters on mathematical games. 'Following the games that depend only on numbers, we have the games which further involve the situation, such as backgammon, checkers, and above all chess. The game called Solitaire also pleased me enough. However, I am considering it in a reverse manner, that is to say, instead of undoing a composition of pieces, according to the rule of this game, which calls for jumping into an empty place, and taking away the piece on which we jump, I thought it would be more beautiful if we reestablished what had been undone, by filling in a hole on which we jump; and by that means, we could propose to form such and such a given figure, if it were doable, as it surely could be done, since it was possible for it to be undone. But, some will say: 'what is the purpose!' I would respond, to perfect the art of invention; because we should have methods for solving

everything that reason can put before us.' " (Gottfried Leibniz, Letter VIII to
M. de Montfort, in Leibniz, *Opera Philosophica*, quoted by Louis Poinsot in
Réflexions sur les principes fondamentaux de la théorie des nombres, Paris,
Bachelier, Imprimeur-libraire, 1845, p. 45-46. See also Poinsot's ground-
breaking *Mémoire sur les Polygones et les Polyèdres*, read before the
Institute on July 24, 1809.)[13]
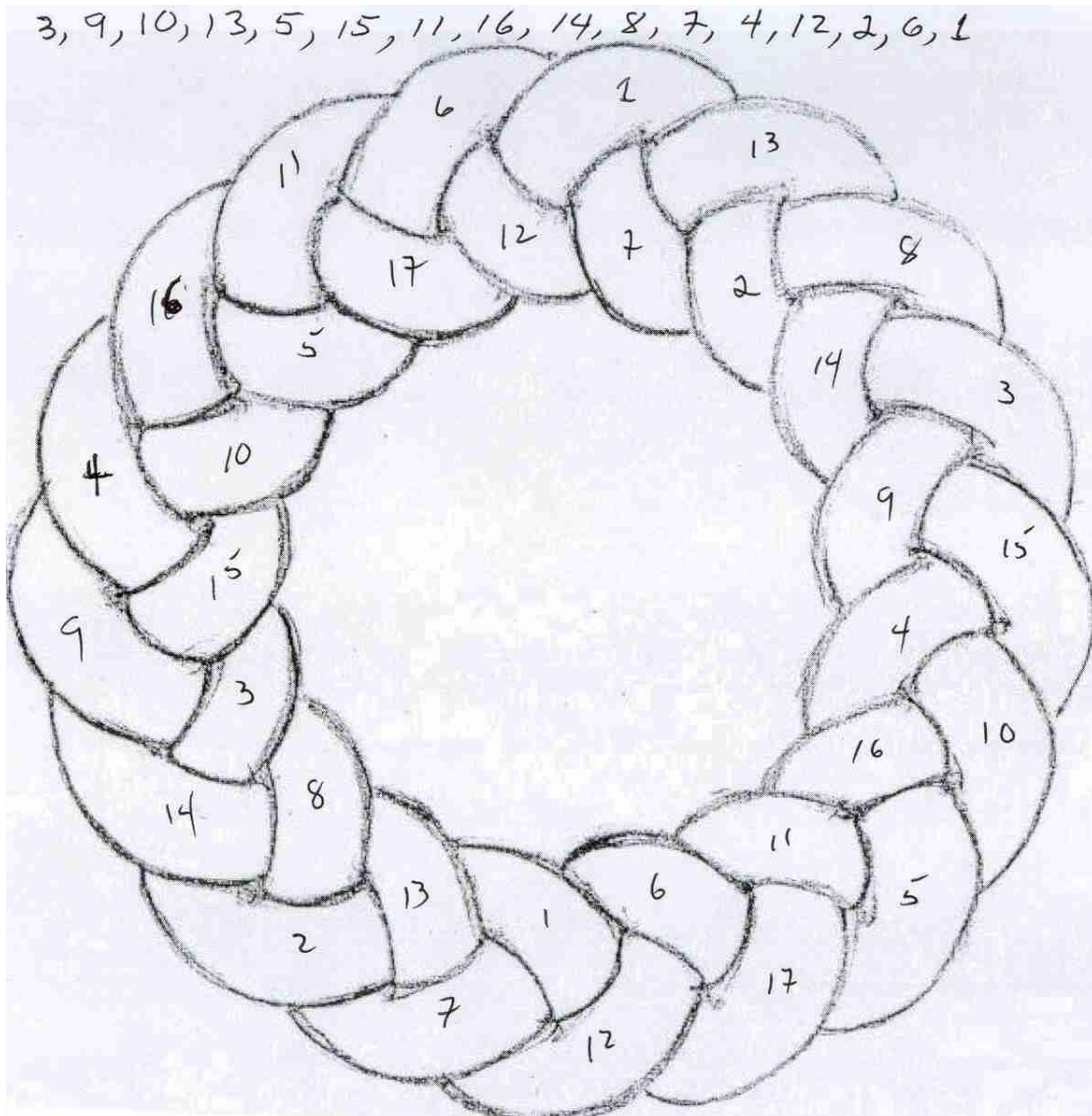
[3 mod. 17] The two series of reciprocals of 19 are inversions of each other. Drawing by Pierre
Beaudry.

---

[13] Pierre Beaudry, *FUSION POWER IS NOT DEMOCRATIC*, p. 5.

Given the ordered sequence of residues of 3 as a primitive root of 17, that is, 3,9,10,13,5,15,11,16,14,8,7,4,12,2,6,1, find the underlying *analysis situs* that will fill all of the seventeen poloidal wave-intervals of the knotwork with the appropriate residues and in accordance with their properly ordered sequence.

Start counting clockwise from noon (1) and consider each poloidal wave rotation of 3 units of action as representing a constant doubling power from one remainder to the next. Each next additional power in the sequence is accessible by adding the number of waves identified by the previous poloidal wave residue number. In other words, the value of the residue or remainder is the value of the number of waves to be counted to get to the next following residue in the appropriate series. No calculation is required to find any of the residues or remainders, and all the reciprocals of 19 are to be found by pre-established parallel harmony across the circle. It is that reciprocal congruence of powers which defines the fundamental characteristic of all numbers as in the Peace of Westphalia.

Poinsot applied this Leibnizian *analysis situs* method of constructive geometry with the use of cycloids and epicycloids, but a more appropriate constructive geometrical method is that of the knotwork torus geometry that Leonardo da Vinci had originally extensively constructed during his 17 years stay in Milan (1482-1499) inside of the *Sala delle Asse*.

Finally, apply the same Poinsot geometrical solution to the required geometry for generalizing a memory function of bringing together four different discoveries of principle with similar reciprocity into a single higher One, and you will have generated a LaRouche *higher hypothesis* in a quadratic form of living process reciprocity as if it were projected onto a surface of negative curvature.

LEONARDO DA VINCI AND BEETHOVEN

Leonardo da Vinci, Sala delle Asse: https://www.discoveringdavinci.com/sala-delle-asse

In his report on ***Beethoven as a physical scientist***, Lyndon LaRouche addressed the issue of negative curvature as an intelligible geometrical Riemannian curvature of physical space-time, which is also an appropriate form of geometry for describing the epistemological dynamics of classical artistic composition, as in the case of Beethoven.

The point that LaRouche made was that the Lydian principle of change in classical musical composition is entirely coherent with the geometry of negative curvature in artistic composition. As he said: "Crucial proof of Beltrami's corrective supplement to Riemann curvature renders intelligible: to a much deeper

degree, the otherwise empirically demonstrable principles of composition of classical music."[14]

Addressing such composers as Bach, Mozart, and Beethoven, LaRouche emphasized the principle of natural beauty as a case of musical beauty which exemplifies the quality of mental life pertaining to mankind as a distinct species apart and above that of the animal. The challenge proposed by LaRouche deals with the axiomatic difference among non-living, living, and cognitive. LaRouche wrote:

"With aid of development of what is known as the study of nonlinear spectroscopy of optical biophysical processes, we are enabled to understand, as a matter of biological principle, whence certain characteristic and crucial features of the singing and hearing of a sung bel canto scale pivoted on either middle C at 256 cycles, or approximately midway between 256 and 257, a value almost precisely 42 octaves below the characteristic frequency of living DNA.

"The intelligible representation of a quadruply-connected manifold, the minimal conception of classical composition, is, at a minimum a proposition in topology lying specifically within the domain of Riemannian physics. However, this representation is not, by itself, an adequate one.

[…]

"The problem is, to restate the nature of the Riemannian point-set, both with respect to each point and to the topology of the Riemann Surface as a whole, to the effect of eliminating the paradoxical nature of the point as such. The solution of that paradox accords, at first and second impressions, with Beltrami's arguments on the subject of negative curvature. Beltrami's argument accords also with the writer's geometrical definition of *negentropy* as adduced from a refutation of a related problem, his refutation of the axiomatic fallacy underlying the so-called Kantian Paradox. This bears also upon the solution to the Parmenides Paradox, whose form of solution is the

---

[14] Lyndon LaRouche, *Beethoven as a physical scientist*, EIR Vol. 16, No. 22, May 26, 1989., p. 16.

central feature of Nicolaus of Cusa's work founding modem non-Euclidean geometry, *De Docta Ignorantia* [*On Learned Ignorance*]. The writer's own formal solution to the Parmenides Paradox was elaborated as a feature of his refutation of Kant." [15]

The 42 octaves range that LaRouche is referring to are "up from the F above middle C to the C two octaves below middle C, which is itself 40 octaves above C = 256. All values are precise musical tones in cycles per second (Hz) plus 42 octaves." This is the domain and the level of cognition which calls for the application of negative curvature as the curvature appropriate to higher hypotheses. The question then becomes: how do you change the "Riemannian point-set" by the motion of a *transfinite becoming*? For instance, how do you transform the polygon-circle discontinuity of the plane domain through a continuous change that is non-entropic in the solid volume domain?

LaRouche obtained on this subject, a crucial insight from one of his collaborators, Dino di Paoli, who described how Leonardo da Vinci had investigated and solved the problem of going from plane geometry to solid geometry by generating caustics as transformative singularities. A similar impulse led Leonardo to investigate and solve the problem of going from plane circular geometry to torus geometry. In other words, how do you turn a plane surface into a curved surface? How do you go continuously from simply-connected to doubly-connected circular action? Di Paoli wrote:

"If you try to transform perspective linearly on a curved surface, a simplistic interpretation of the so called Leonardo curved perspective, you end up with the following problem. Your focal points are no longer points, but caustics.

[…]

"The amount of Leonardo's illustration on this field, and on the related reflection on a curved surface, proves that he faced it, and solved it. His solution, through the discovery of the parabolic or elliptic mirrors , which

---

[15] Lyndon LaRouche in Op. Cit., p. 18.

eliminate the caustic and reestablishes a focal point, is geometrically equivalent, in avoiding of projective distortion between a curved surface and a plane, to using what is called "Gaussian" curvature, that is, the elliptic type.

"But, projectively, Leonardo's solutions, through the compass of proportion, lead, if elaborated, to Desargues's theorem, and, more interestingly, to the establishing of proof of the projective invariance of the Golden Section."[16]

The study of boundary conditions between the second and third dimensions are difficult to replicate and generally results in the creation of odd singularities like caustic plane projections through wineglasses and the like; however, Leonardo was able to create a new domain of investigation which can best be termed a domain of torus geometry with doubly-connected knots.

Leonardo's challenge was meant to provoke the spectator to look for the links between surfaces of two and three dimensions and establish an ordering principle of knotty wave patterns between the two. Among Leonardo's works, there are about fifteen paintings which display such knots, including the famous *Mona Lisa* and *The Last Supper*.[17] See if you can find them on your own.

---

[16] Quoted by Lyndon LaRouche, Op. Cit., p. 29.

[17] The most elaborated form of such Leonardo knot designs can be found in six intricate circular copperplate engravings produced in Milan during the period of 1482 until 1499. See my report: LEONARDO LEAPFROGGING BETWEEN IDEAS AND SENSE PERCEPTIONS. The Academia Leonardi Vinci was originally founded at the court of the Duke of Sforza in Milan. https://web.math.ucsb.edu/~millett/Papers/Millett2014Leonardov5.pdf.
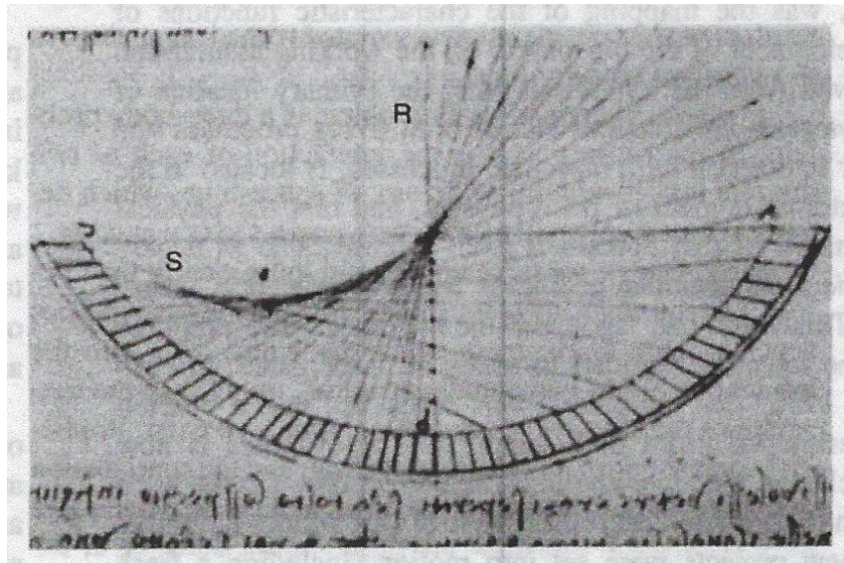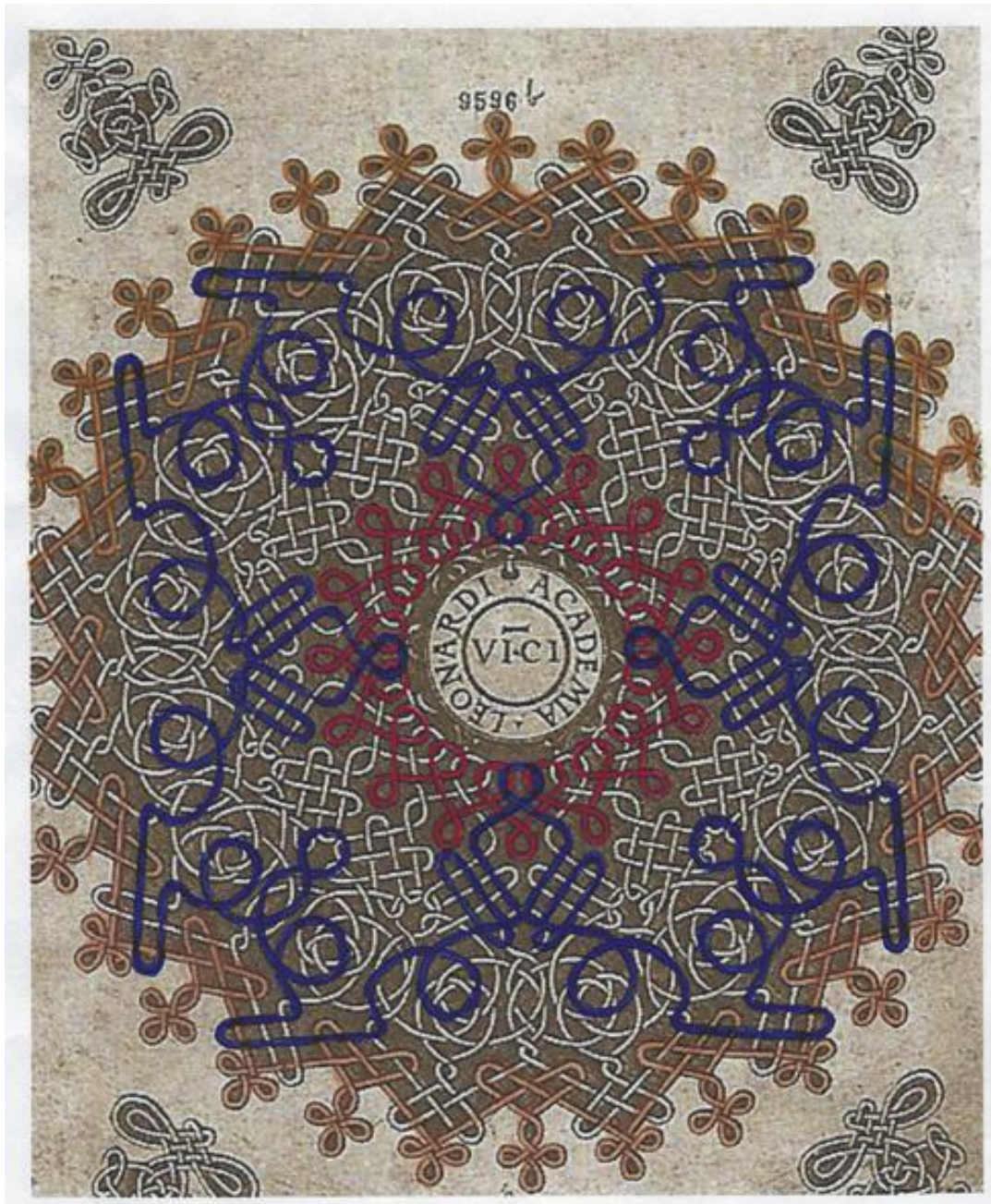
Leonardo da Vinci caustic
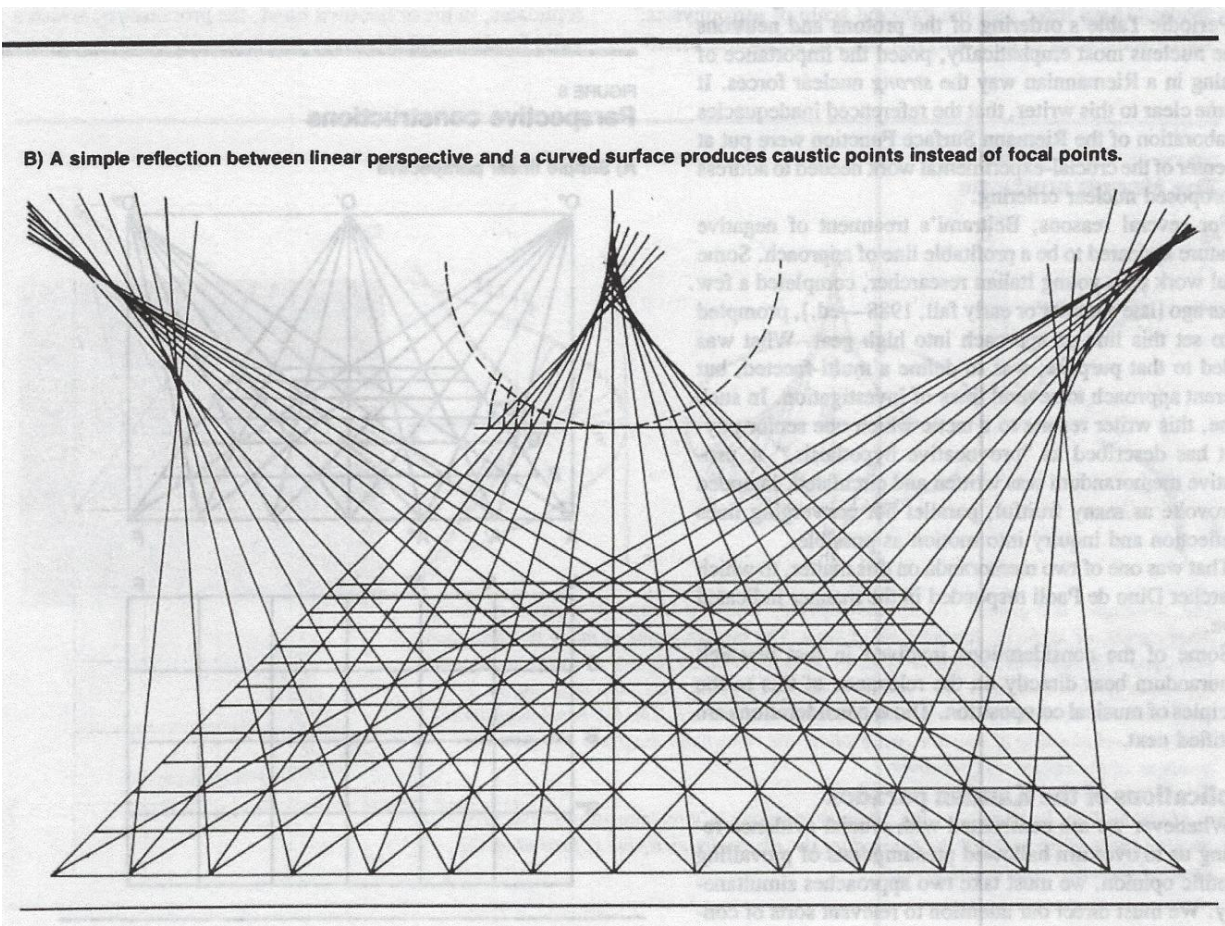
Di Paoli's drawing on changing the curvature of a perspective plane through caustic regions.

Leonardo's most significant display of knots is located in the Duke of Milan's *Sala delle Asse.* The room was used as a meeting place for the *Academia Leonardo Vinci*, in which the Duke and Leonardo held meetings regularly during a period of seventeen years.


Leonardo da Vinci Academy logo with four kinds of interlaced quadratic links: 4 sets of 12 white links, 8 blue links, 16 red links, and 32 brown links.

The room is filled with challenging knotty ironies and puns on the names of the Duke and of other families, such that when someone enters the room he or she is provoked into investigating puzzles about how the mind and the living universe work and interact as a One over the Many.

The mind is made up of ironic knots similar to the interlacing of the Leonardo mulberry trees. For example, Leonardo's "Moorish" designs are filled with mulberry (moro) trees, evoking the name and the strategic role of his patron, the Duke of Milan Ludevico Maria Sforza il Moro (the Moor).
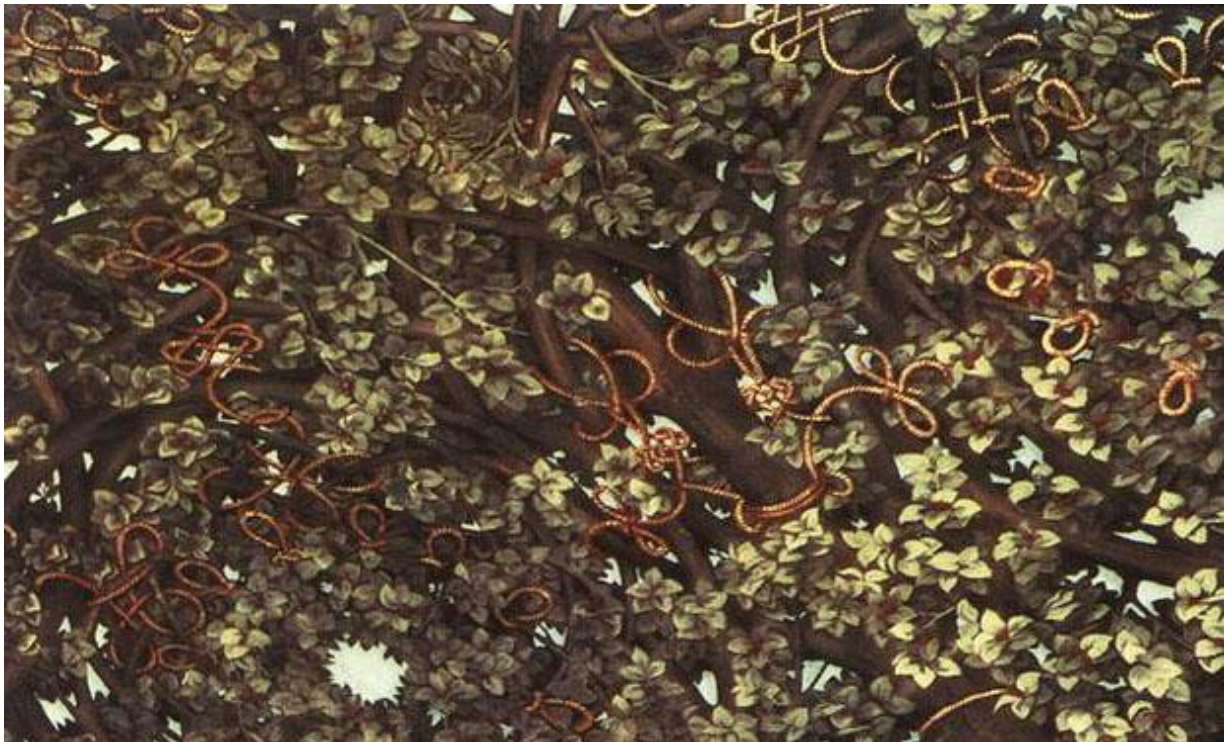

Restoration of Leonardo da Vinci's *Sala delle Asse*, Milan. Interlaced mulberry branches.

But Leonardo's irony has more powerful ideas to offer than puns in the playful domain that Leibniz called *analysis situs*. Follow, for instance, the method of transferring the numerical values of polygons from simple circular action into a doubly-connected circular action torus and you will discover Leonardo's axiomatic transformation principle of changing from a lower to a higher manifold works; with or without having to go through the discontinuity of mathematical singularities.
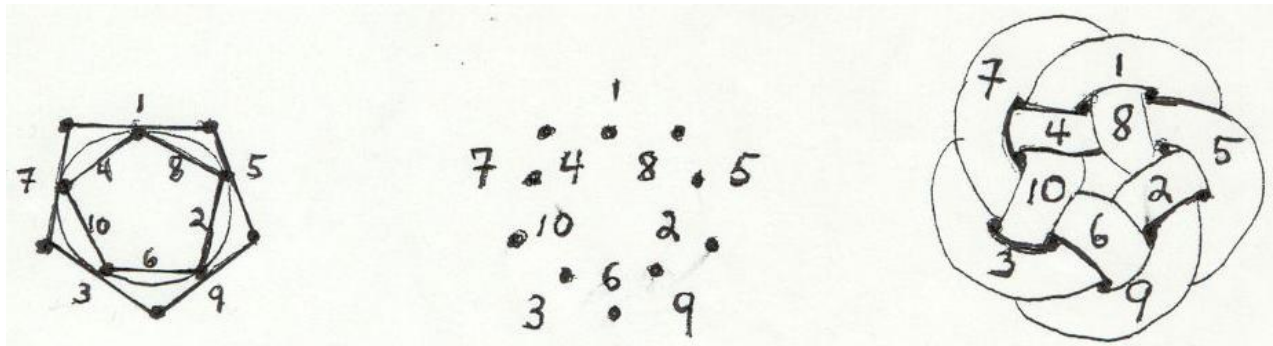
Axiomatic transformation from pentagonal simple circular action to doubly-connected circular decagonal action.

One might ask why Leonardo used trefoil and quatrefoil geometrical variations but never any form of pentagonal symmetry. The answer is because quadratic symmetry always has complete reciprocity and the doubling series of the power of two is based on such a doubling function within the well-tempered musical system of C-256.
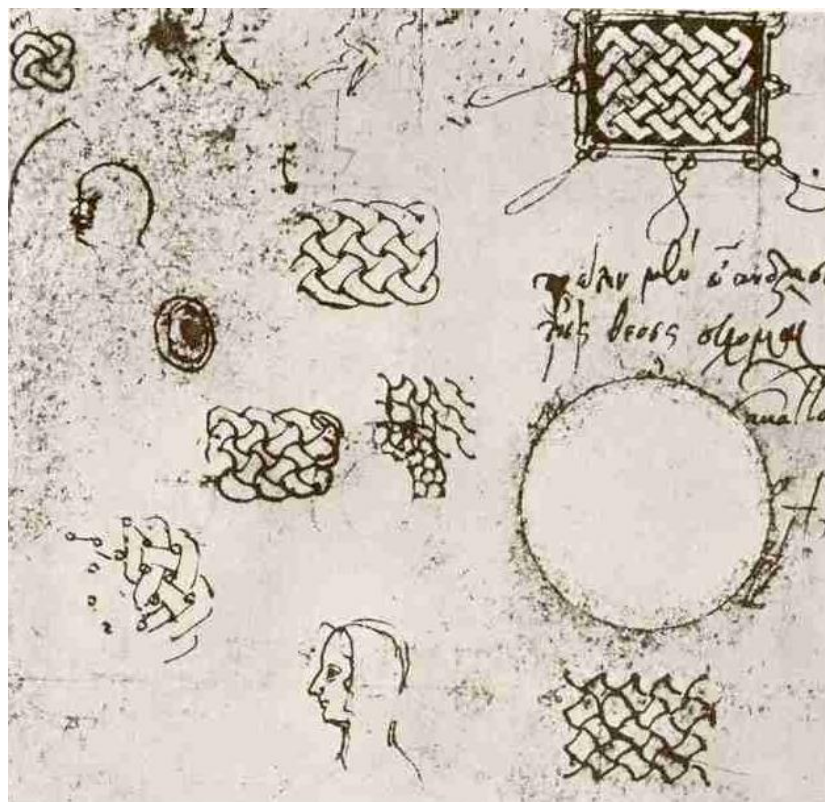
Leonardo da Vinci knots

One might also be tempted to ask whether such reciprocal Leonardo designs were created for amusement only. The answer is no. If one looks at them, as metaphors of the creative process, one might get a better measure of Leonardo's epistemological purpose and the reason for his concentration on negative curvature.

Think of these Leonardo knots as mnemonic step-finders inside of *a process of change forming maze-like pathways* that one can discover simply by following their motion, inside of which you can always get lost, but also locate where you are by projecting yourself into the future, then catch yourself again by jumping backward into the past, and finally, remembering your steps by leaping forward back again into the present, where you had started from, but ahead of yourself.

Such knotty gymnastics can also be power multipliers and dividers, as Poinsot generated for the geometry of primitive roots; similarly, they can also be performative short pieces of musical jokes, such as memory functions based on the principle of Lydian variations searching for truth on some theme of the soul, as Plato discusses in the *Phaedrus* and the *Timaeus*, or as Beethoven wrote in his more advanced *Late Quartets,* whose modality Marian Anderson sang in ***They Crucified My Lord***. Here, I suggest using these Leonardo knots as Lydian memory modular functions mimicking continuous epistemological connections between two axiomatically transfinite manifolds.

CONCLUSION: PLATO'S *EXAIPHNĒS* AND BEETHOVEN'S LYDIANS

Finally, let us see if Plato's idea of a sudden *exaiphnēs* discovery can be applied musically to Beethoven's Piano *Sonata Quasi Una Fantasia*, Opus 27, No. 2, in which the four parts of a cyclical quadratic reciprocity of measure 35 **[F#, B#, A], [D#, B#, F#], [D#, A, F#], [B#, A, D#]** and the first 10 Lydian intervals of measure 36, **[B#, F#, A], [D#, F#, B#], [D#, A, B#], F#** act as a complete and closed Leibnizian monad.
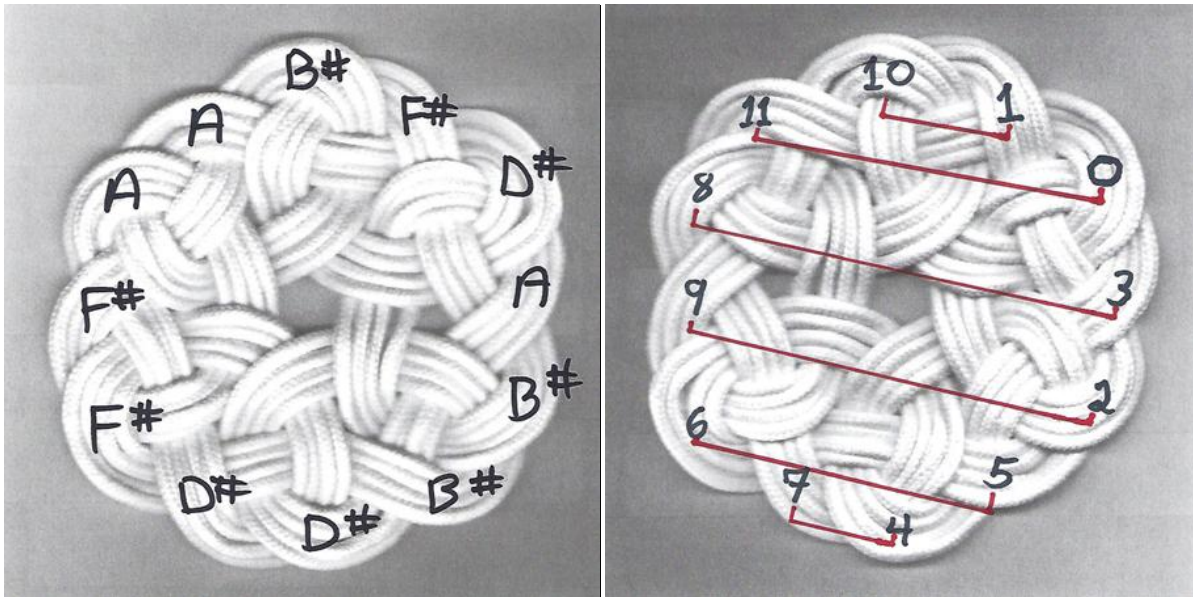
Following Cusa's idea of unfolding and enfolding method of discovering the higher domain (see next three figures). Start rotating through the knotwork at 1 o'clock **(F#)** and unfold down clockwise to 4 o'clock **(B#)**, then enfold back to 3

o'clock **(A)**, and unfold down forward to 6 o'clock **(D#)**, then enfold back to 5 o'clock **(B#)**, and unfold up forward to 8 o'clock **(F#)**, then enfold back down to 7 o'clock **(D#)**, and unfold forward again to 10 o'clock **(A)**, then enfold back to 9 o'clock **(F#)**, and unfold forward up to 12 o'clock **(B#)**, then enfold again back to 11 o'clock **(A)**, and unfold forward to 2 o'clock **(D#)**, at which point the entire Lydian dissonant process gets resolved into the key signature of **C#** minor, which you now hear resonating in your mind.

Beethoven's *Sonata quasi una fantasia*, Opus 27, No. 2, measures 31 to 36.

Beethoven's *Sonata quasi una fantasia* Opus 27. No. 2, measures 35 (clockwise) and 36 (counterclockwise). Note the balancing 6 pairs of reciprocals of 11 which are [10-1], [11-0], [8-3], [9-2], [6-5], and [7-4].

Then, start again counterclockwise and play the first 10 notes of measure 36, backward, starting at 12 o'clock **(B#)**; move down to 9 o'clock **(F#)**, go back up to 10 o'clock **(A)**, then down again to 7 o'clock **(D#)**, continue backward to 8'oclock **(F#)** and move across to 5 o'clock **(B#)**, then rotate back to 6 o'clock **(D#)**, and up again to 3 o'clock **(A)**, which then leads you back down to 4 o'clock **(B#)**, and finally forward up to your original starting point at 1 o'clock **(F#)**.

We may now have the impression that we have completed a Leibnizian quadratic monad by generating the key signature of Beethoven's **C#** minor Piano *Sonata quasi una fantasia* Opus 27, No. 2; but did we really? This process may also have given us the impression that we have found a key for generating all of the 24 key signatures of the well-tempered musical system; but is that really true? Have we really found something of any significance or is this just another visual illusion projected on the dimly lit wall of Plato's cave?

As my good friend and musical advisor, Fred Haight, reminded me, one should not consider my knotty metaphor of the Beethoven measures 35 and 36 as curve fitting, but simply as a metaphor of the dynamic principle of change between

dissonances and their resolutions. Fred further noted that in measure 35, the four groups of three minor thirds act on each other by alternating ascending Lydians and descending minor thirds; while the inverse takes place in measure 36 where the four groups of three minor thirds act to change one another by alternating descending Lydians and ascending minor thirds. He is right; the knotwork is a knotty attempt to dissolve the dissonances into a resolution which, in this case, calls for the key signature of C# minor. However, look a little further. Doesn't the Lydian monad dissonance bring together the 6 pairs of reciprocals of 11 into a single well balanced coincidence of opposites? Isn't it such an ordering of opposite reciprocals which generates the envelope of negative curvature?

In the end, Plato may have been the wiser when he considered that no matter how skillful our attempts are to rid ourselves of our state of perplexity before the complexity of the mind, we will never get the full measure of it, and we will not succeed, ultimately, in concluding one way or another. As Bel Kaufman suggested, we might as well accept the fact that all we can do is to continue raising our glasses to a far away friend, even after we have stopped drinking.

FIN