
ANALYSIS SITUS AND TIME-REVERSAL CAUSALITY IN TEMPORAL ETERNITY

A Leibnizian *analysis situs* of Lyndon LaRouche's principle of Relative Potential Population-Density (RPPD)

by Pierre Beaudry, 5/18/23

FOREWORD

Do you know where the future is? Do you know how to get there? Furthermore, do you know how to go anywhere else once you get there? Those are the questions that I have to investigate in order to find the pathway that will allow me to travel wherever I want to go. However, the question is not so much where I want to go, but how I'm going to get there.

Lyndon LaRouche's discovery of the principle of Relative Potential Population-Density (RPPD) regarding the causality of temporal eternity is the pathway I am talking about. This pathway is not easy to find as it is not moving the way you might think it is, because it is always going backward through final causality, that is, by time-reversal. The first step that one must take in order to replicate such a discovery of principle of time reversal always has to come from the future, and from there go back through the present to the past in order to change it, and turn it into what it should have been. Once you find such a pathway, it gives you a universal power to change the universe.

Today, I am going back to two classes I gave 27 years ago on the question of time-reversal in temporal eternity that LaRouche raised in October of 1996 regarding Plato's *ontological paradox* of the *Parmenides* published in EIR on October 11, 1996, under the title: [*The Essential Role of 'Time-Reversal' in Mathematical Economics \(larouchepub.com\)*](#)

I was then and am still attempting to reach for something that wasn't there and which is still not there today. This state of mind caused me to discover the pathway of a process of change instead of some "thing" that I thought I was looking for. In that same period of time, 1996, Lyndon LaRouche made the following point about his own time-reversal moment of discovering temporal eternity concerning Riemann, which appears in a footnote to his report. LaRouche wrote:

“The change which distinguishes characteristically human ideas of the future, from the bestial intent which might be expressed by a beast, or in a man's moment of beastliness, is always of the *ontological* quality designated by the connotations of the term *Platonic idea*, rather than mere contemplation of a real, or merely desired object of sense-perception.⁸

“[Footnote 8- The notion is, that the type of paradox elaborated within the *Parmenides* can be solved only by recognizing *change*, rather than “fixed objects” of sense-perception, as the form of the primary substance within physical space-time. I.e., in this dialogue, which serves as an implied preface for all of his later dialogues, Plato reconstructs Heraclitus' much-cited and often misapprehended statement: *Nothing is constant, but change.*]

“We may desire the coming into being of a condition which is consistent with a theorem of an established hypothesis, a condition which does not presently exist. More profoundly, we may desire a revolutionary change, a new hypothesis, to replace the reigning hypothesis of existing practice. The properties of Plato's method of hypothesis are indispensable keys for rendering transparent the meaning of the “time-reversal” paradox.

“Bernhard Riemann's 1854 habilitation dissertation then serves as a pivotal reference, for transforming the mathematics of “time-reversal” into

the form of expression suited to validation according to Nicolaus of Cusa's and Riemann's principle of experimental physics: *measurement*.”¹

Lyn is saying here that time is not clock-time; *time is the changing measurement of human progress; time is a continuous pathway of change through temporal eternity*. What I did not fully realized in 1996, and I am only now beginning to realize, is that this principle of commensurable “*measurement*” underlying numbers (since LaRouche refers to it as “mathematical economics”), must be an experimental *measurement of change* which has to do with the Cusa-Gauss-Riemann method of measurement of the complex domain, which must be folded in with what Leibniz identified as his method of *analysis situs*.

The issue, here, is a form of space-time which is common to both the process of transformation of discoveries of principle and to the geometry of the ordering of whole numbers. Such a pathway of numbers is not a simple matter of magnitude, but more fundamentally, a matter of properly locating numbers as units of action in the development of human progress.

In a 1987 internal memo on [*Agapē in Musical Education*](#), LaRouche stated: “The musical universe is the Gauss-Riemann complex domain, whose characteristic harmonic orderings, as exhibited by the Kepler-Gauss astrophysical orderings, determine the harmonic orderings in the same way as for astrophysical trajectories. The curvature of musical space-time is the same as for astrophysical and sub-atomic physical space-time. They are not merely parallel; they are, all three, one and the same.”

This means that all three physical domains are Lydians in musical terms, and from that vantage point, the universe itself, in the small as in the large, is Lydian precisely because musical composition is agapic.

¹ [LaRouche—Time-reversal \(schillerinstitute.com\)](#) I. [LaRouche—Time-reversal \(schillerinstitute.com\)](#) II, and Lyndon LaRouche, [The Essential Role of 'Time-Reversal' in Mathematical Economics \(larouchepub.com\)](#), EIR, Vol. 23, No. 41, October 11, 1996, p. 20.

As far as I know, no pre-existing higher hypothesis has ever been proposed before or after LaRouche established his authority on such a matter of knowledge. Therefore, we must look for *constant change in temporal eternity*.²

FIND THE NUMBERS THAT ARE NOT THERE...

Fill in the numbers (Figure 1.) in such a manner that they demonstrate, performatively, how intervals of action between numbers increase indefinitely by one.

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 35, 27, 29, 31.

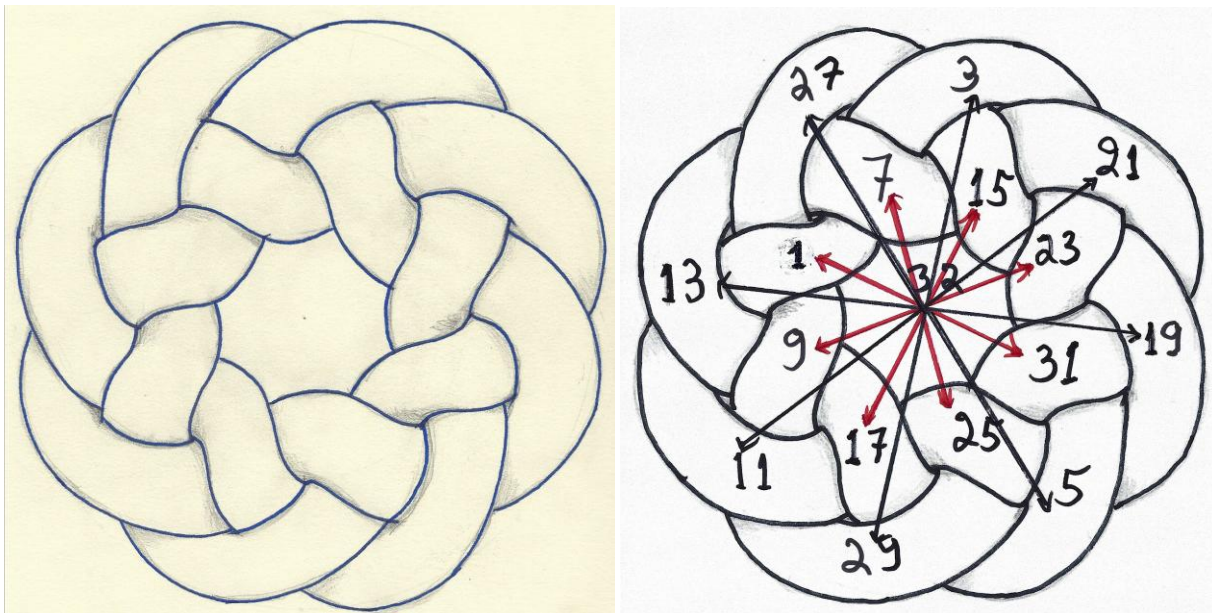


Figure 1. Pathway of odd numbers in temporal eternity

The eight reciprocals of 32 balance the unity of the whole system and keep the extremes in check while they rotate around each other. Replace the numbers by ideas or sovereign nation-states and you should get a similar result.

A similar congruence of reciprocals was developed by Gottfried Leibniz when he discovered the principle of unity between the East and the West. Leibniz

² See my 2006 pedagogical:

http://amatterofmind.org/Pierres_PDFs/EPISTEMOLOGY_I/7.FERMAT'S_GREAT_THEOREM.pdf

discovered that cyclical and non-linear geometry of change had been established by the great Chinese philosopher Fuxi with his elaboration of the *I Ching* (*The Book of Changes*):

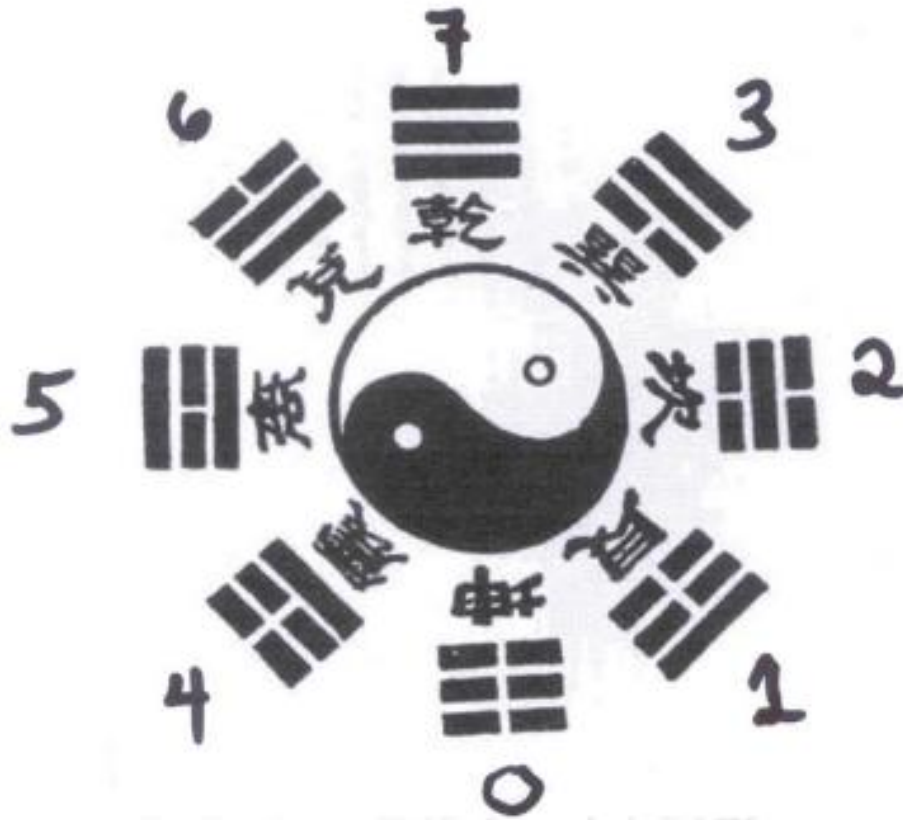


Figure 2. Fuxi's eight trigrams. Note how the reciprocity of all of the numbers across the circle is everywhere 7 and the numbered lines are everywhere opposite inversions of each other across the circle.

ODD NUMBER TORUS CYCLE

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31,
33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63

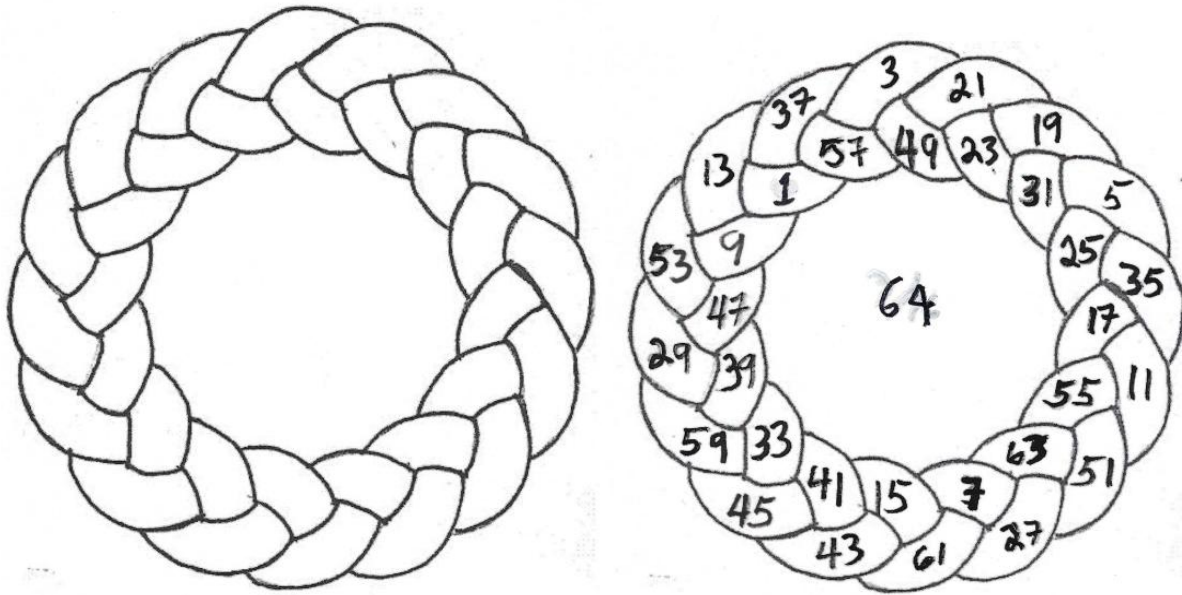


Figure 3. Reciprocals of odd numbers

Generate the series of odd numbers and rotate them inside of a torus whose double circular rotation moves by adding one unit of action after each interval. The entire torus will be entirely filled and perfectly balanced with 32 pairs of reciprocals at opposite ends of the cycles whose totals are all 64.

TIME-REVERSAL AND THE BRACHISTOCHROME: THE GEOMETRY OF TEMPORAL ETERNITY IS CIRCULAR ACTION

This report is a short review of two classes I gave in the Baltimore office of the Labor Committees ICLC during the period of 1996, which have recently been uploaded on the OaklandLYM.com archive website thanks to Andrew Laverdiere: [Pierre Beaudry on Leibniz and Bernoulli #5 - YouTube](#), and [Pierre Beaudry Class #6 Analysis Situs](#)

In Class #5, the emphasis was put on the discovery of principle whereby the underlying principle of nature must also be the same for the mind, because each transcends both the domain of mechanics and of optical physics.³

Experimenting in the field of gravity with the cycloid curve of the brachistochrone gives you a sense of what final causality requires from the vantage point of both physics and epistemology. Final causality is the essential focus here.

Jean Bernoulli's discovery of the brachistochrone is most significant because it has the power of changing the way the mind thinks about everything, especially about numbers, and most fundamentally, about time. It has the power of transcending empiricism, utilitarianism, and other forms of positivist thinking which have dominated our school system for centuries. Bernoulli's discovery is the path of least action and least resistance that nature has produced by increasing the density of singularities throughout temporal eternity.

Compare this condition of nature with what is going on inside of your mind. As LaRouche kept insisting throughout his life's work, the more discoveries of principle you make, the more your thinking process will become efficient in taking the least action pathway in order to achieve your purpose in thinking. In essence, what takes place in the physical universe also takes place in the human mind, but not in the way that Newton or Descartes were thinking. The Newtonian idea of causality is best illustrated by the aptly named Newton's Cradle. (Figure 4.)

³ See my two reports:

http://amatterofmind.org/Pierres_PDFs/AXIOM%20BUSTING/THE_LONG_AND_SHORT_WAVES_OF_EQUAL_AND_LEAST_TIME.pdf and

http://amatterofmind.org/Pierres_PDFs/CONSTRUCTIVE_GEOMETRY/CONSTRUCTIVE_GEOMETRY/19_HOW_LEIBNIZ_CHANGED_THE_PAST_FROM_THE_FUTURE.pdf

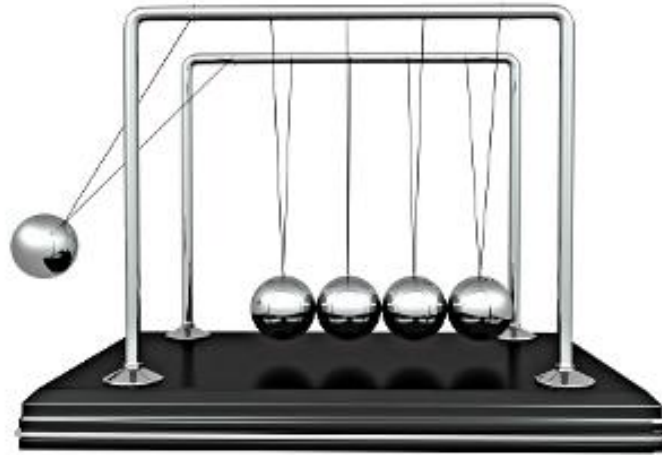


Figure 4. Newton's Cradle or Descartes' "reflection of bullets"

The infantile Newtonian and Cartesian ways of thinking regarding the nature of the physical principle of light is to think that the changes that take place between past, present, and future, are mechanical and percussive actions; that is, action-reaction: How do you get out of such mental percussiveness? The only way of thinking outside of percussiveness is to have a purpose, an intention, a finality of action. But, first you must acknowledge that the physical organs you have are not the cause of what you know; it is your intention for the future which determines what you are willing to do with your mind.

Leibniz said that you think because you have a purpose, an intention, an objective in the back of your mind. Thus, the pathway of least action cannot be found by percussive action from the past to the future, but rather through final causality from the future by the willful time-reversal action which goes from the future back to the present, which you then replicate by taking it from the present to the past. In *Tentamen Anagoricum*, Leibniz clearly corrected this Cartesian "reflection of bullets" by identifying the fallacy of Newton's Cradle:

"For the way in which Descartes has tried to explain the law of refraction by efficient causes or by the composition of directions in imitation of the *reflection of bullets* (emphasis added) is extremely forced and not intelligible enough. To say no more about it here, it shows clearly that it is

an afterthought adjusted somehow to the conclusion and was not discovered by the method he gives. So we may well believe that we should not have had this beautiful discovery [of Tentamen Anagogicum] so soon without the method of final causes.”⁴

The epistemological flaw that Leibniz exposes here is that most people tend to think of causality in the wrong way, that is, by looking in the wrong direction and therefore missing the idea of position or situation of time-reversal in physical space-time. Leibniz is calling on us to elevate our minds to the highest anagogical level (*ἀναγωγή*) by relating ultimately to the destiny of mankind.

The better way of thinking that Leibniz had introduced is to elevate yourself from the future and work your way backward from final causality, and then steer the present to change the past toward its proper future destination. The principle of least action is located in the nature of the final cause which comes from the future, and not from the past. If you think of change by starting from the past, you end up bumping into objects by percussive effects of action-reaction, without ever changing (e. g. Newton's Cradle). Your life becomes a boxing match of the same ole same ole modality of conflict and war; no human progress could ever come out of such a process. Think of it as the father who teaches his children not to make the same mistakes he made in the past so they can become better than he was in the future. Man progresses and changes only when he is oriented through change by thinking from the future in that way and nature obeys ultimately the same law of God's wisdom.

The hysteria over Leibniz's polemical and axiomatic intervention, by the British oligarchy amongst others, is best exemplified by the reaction of the great defender of Descartes, Claude Clerselier, who wrote a letter to Pierre de Fermat on May 6, 1662, denouncing Fermat's principle of least time action as he applied it to light. Clerselier wrote: “The principle that you take as the basis of your demonstration, namely that nature always acts in the shortest and simplest ways is merely a moral principle, and not a physical one; it is not and cannot be the cause

⁴ Gottfried Wilhelm Leibniz, *Philosophical Papers and Letters*, Volume II, Kluwer Academic Publishers, Boston, 1989, p. 480.

of any effect in nature... For otherwise we would attribute knowledge to nature; but here, by 'nature', we understand only this order and this law established in the world as it is, which acts without foresight, without choice, and by a necessary determination."⁵

Since nature "must must" as Schiller put it, there is no way, according to Clerselier that light can have foresight and make a choice of moving by the shortest path, because nature cannot think. What is obvious, here, is that Clerselier could not figure out that God Himself had put that "blind" intention into nature. Nature does not need think in order to take the shortest path.

Cartesian Clerselier denies final causality for both divine and human reason. For Clerselier, there is no direction and purpose in the universe, because there is no progress; everything is same ole, same ole, and therefore, we cannot be in the "best of all possible worlds" as Leibniz said. This is a rejection of subjectivity in science and a refusal to accept that the mind can progress to higher relative cardinalities by means of axiomatic changes. Plato explained how that process of change works in his *Parmenides*:

"When it (instantaneous change) passes from being in existence to ceasing to exist, or from being nonexistent to coming into existence, it is then between certain motions and states; it is then neither existent nor nonexistent, and it is neither coming into existence nor ceasing to exist. By the same reasoning, when it passes from one to the many or from the many to one, it is not either one or many, and it is not being separated or being combined."⁶

But, what is the significance of such a state of inbetweenness? If it is the case that when something changes, it has to pass into the inbetweenness of an intermediate state of limbo, which is somewhere between motion and rest, then, how could such an intermediate state be of any significance for science? What is this axiomatic transfer all about?

⁵ P. Tannery and C. Henry, *Oeuvres de Fermat*, Vol. 2, Gauthier-Villars et fils, Paris, 1894, pp. 464-472. report [18. ANALYSIS SITUS AND THE PRINCIPLE OF RECIPROCITY.pdf \(amatterofmind.org\)](#), p. 23.

⁶ Plato, *The Parmenides*, trans., F. M. Cornford, 157a.

Take the case of an axiomatic change in which everything that existed before in your mind gets transformed and no longer exists in the old form it used to have after a new principle has been introduced eliminating the previous axioms of your belief. Not only is the past state of mind no longer living while the new state of mind is alive and well, but the mind becomes significantly improved after that change takes place, as if it had passed from non-life to life. Here you have an interesting inversion in which a new life comes after the death of the old one. And, meanwhile, you have not felt a thing while going through that change! Is that death to life changing process not similar to the life and death changing process we have just considered with Plato's *Parmenides*? How can such a motion of change be preestablished before it starts moving?

Here, it is useful to adopt the classical method of the Socratic dialogue in order to smoke out the hidden Clerselier type of underlying assumptions behind the study of isochronicity illustrated in Figure 5. What the Newtonian positivist would say at this point is that there is no such discovery of principle underlying that curve, because everything is pure mechanics and there is no such thing as hypothesis: *hypotheses non fingo!* In other words, some people never know where they are going unless they are provoked to move in some way. As LaRouche showed, such a reaction is the equivalent of the bully who is caught by his mother with his hands in the cookie-jar, and who yells back: "What cookie-jar?"

The study of isochronicity

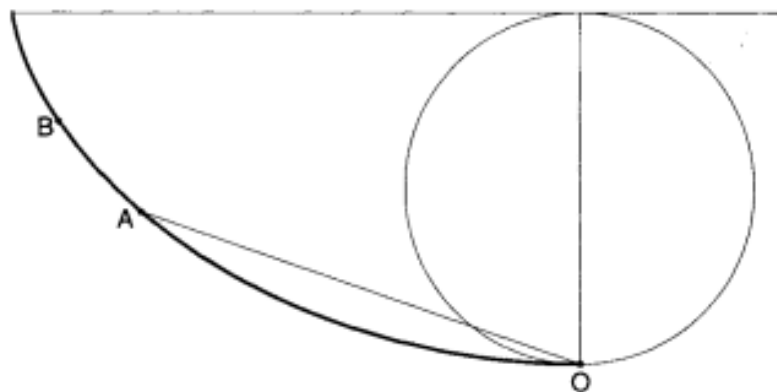


Figure 5. The time it takes for the rolling ball to fall to O, along the arc, from any other point B, is the same as from A: that is isochronicity. [Isochronous curve \(mathcurve.com\)](http://mathcurve.com)

THE LONG AND SHORT WAVES OF EQUAL AND LEAST TIME

[Pierre Beaudry Class #6 Analysis Situs](#)

In October 1996, Lyndon LaRouche posed a fascinating problem of geometry of position that Leibniz called “*analysis situs*”, which led me to discover a geometrical application of what Lyn had identified as the principle of axiomatic transformation of the human mind. The characteristic of such a principle corresponds to what Leibniz and Bernoulli had identified as the principle of least action, or as the principle of equal and least time. A record of this discovery was made in video format: [Time-reversal Lecture Pierre Beaudry 1996 - YouTube](#)

The problem this geometrical application poses is as follows: What is the epistemological nature of measuring? Can you measure anything significant with a ruler? No. How do you measure change? Aha! Measuring change is *analysis situs*. What does that mean?

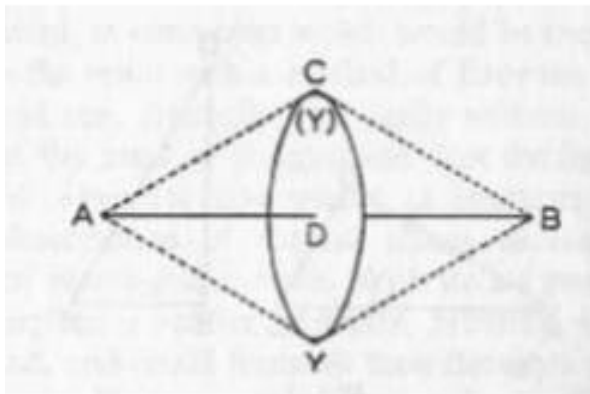
Take prime numbers for example. How do you determine the manifold of prime numbers or the geometry of whole numbers in general? When you ask such a question, you are no longer measuring a simple distance; you are measuring the process of transformation from a lower to a higher order of existence, you are *measuring change in temporal eternity*. You are measuring progress. That's what *analysis situs* means.

How can one establish the geometry of such multiply-connected circular action? First, get rid of the mental habit of counting numbers by representing them on a straight line, such as a ruler, which you then divide at infinity. Instead, look at the directionality of motion and of change. This is the very nature of *analysis situs* that Leibniz identified. Don't treat numbers as magnitudes, treat numbers as changing situations; look at numbers as pertaining to the geometry of situation rather than to the algebra of magnitude. If you think like that, then everything you have thought before will be put into question and will be changed. Gauss commented on this and wrote the following: “About the *geometrica situs* that

Leibniz had foreseen and where only a few geometers have given it a mere glance, we know virtually nothing after a hundred and fifty years.”⁷

This is Gauss writing a hundred and fifty years ago, which means that for us, it is after 300 years, and we still don't know anything about it. So, the time has come to attempt a few hypotheses on the matter by following what Gauss meant when he said: “There is a problem at the limit of *geometrica situs* and algebraic magnitude.” That's the limit I am going to investigate here. What you want to look into with Gauss and Riemann is a higher domain that goes beyond your sense perception and which makes your idea of geometrical space coincide with temporal eternity. Take the example that Leibniz examined in his paper, [*Studies in a Geometry of Situation with a Letter to Christian Huygens \(1679\)*](#).

Take the case of Figure 6 taken from Leibniz's paper, and consider this simple example as representing the revolution of a circle generated by simple circular action. Leibniz wrote: “Given three points A, B, C, to find a fourth point Y which has the same situation as C in relation to AB. I assert that there is an infinite number of points which satisfy that condition and that the locus of all these points



is a circle.”⁸ Here, Leibniz simply constructs a circle by circular action. There is nothing more complicated than that.

Figure 6. Leibniz the circle in *analysis situs*

Next, imagine that you are sitting in a swivel chair that someone is rotating around the room at the same time that you are rotating some small object C which is attached to the mid-point of a string whose ends A and B you are rotating in front of you with your two hands. What sort of circular action are you now generating for object C? The new situation of

⁷ See my report: [18. ANALYSIS SITUS AND THE PRINCIPLE OF RECIPROcity.pdf](#) ([amatterofmind.org](http://www.amatterofmind.org))

⁸Gottfried Wilhelm Leibniz, *Philosophical Papers and Letters*, Volume II, Kluwer Academic Publishers, Boston, 1989, p. 252.

object C describes a doubly-connected circular action. C and the circle it generates are then rotating inside of a higher manifold in the form of a spiral.

When someone pulls your chair around the room, this process describes the rotating and orbiting motion of a planet around the Sun. This doubly-extended circular rotation and circular traction generates the *analysis situs* of a torus. It may not reflect the complexities of a real planetary orbit, but it minimally describes the principle of composition of its two motions throughout temporal eternity.⁹

This experiment shows how to go from simple circular action to doubly-connected circular action by opposing the two motions (toroidal and poloidal) at right angle to one another. In Riemannian terminology, what this demonstrates is the axiomatic transition between a simply-extended manifold and a doubly-extended manifold. As the new added dimension changes the position of the objects in space, these objects become dependent on their continuously changing positions in temporal eternity. Riemann explained this as an anti-Euclidean approach to geometry:

“These conditions (the Euclidean assumption that lines are independent of position) in the first place can be expressed thus: that the measure of the curvature in every point is equal to zero in three directions of surface; and therefore the metric relations of the space are determined when the sum of the angles in a triangle is everywhere equal to two right angles.

“In the second place if one assumes at the start, like Euclid, an existence independent of situation not only for lines but also for bodies, then it follows that the measure of curvature is everywhere constant; and then the sum of its angles in all triangles is determined as soon as it is fixed for one triangle.

“In the third place, finally, instead of assuming the length of lines to be independent of place and direction, one might even assume their lengths and direction to be dependent of place. Upon this understanding the changes

⁹ This experiment can be seen in my video: [Pierre Beaudry Class #6 Analysis Situs](#). See also: [Microsoft Word - FERMAT'S GREAT THEOREM.doc \(amatterofmind.org\)](#).

in place or differences in position are complex quantities expressible in three independent units.”¹⁰

Next, apply the same principle of *analysis situs* to the human mind. The Riemannian epistemological transformation from an n manifold to an $n+1$ manifold is the same as the Leibnizian transformation from algebraic magnitude to geometrical *analysis situs*. If you treat discoveries of the human mind as having the same *analysis situs* as primitive roots, then the following Figure 4 demonstrates the analysis situs of a higher hypothesis.

DISCOVERIES OF PRINCIPLE IN TEMPORAL ETERNITY

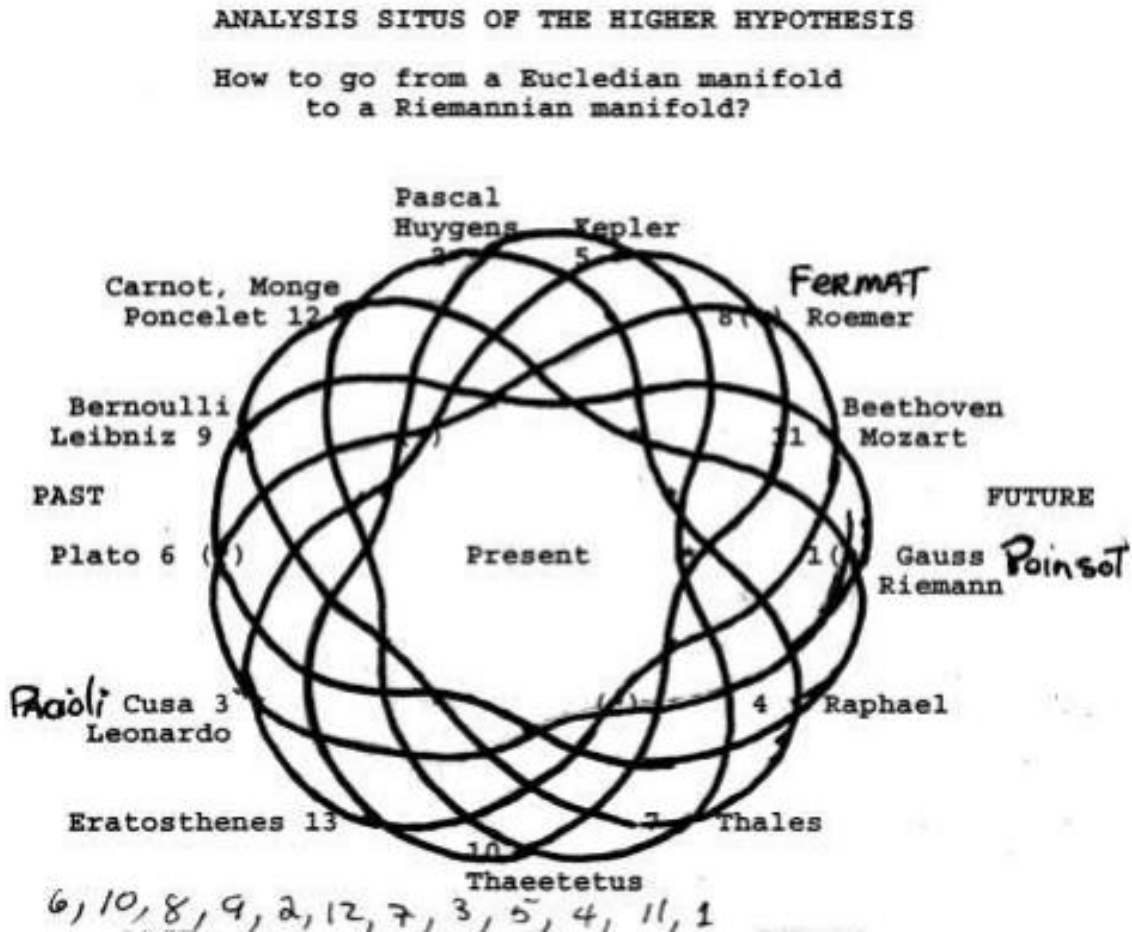


Figure 7. Twelve discoveries of principle ordered according to a Riemannian manifold

¹⁰ Bernhard Riemann, *On the Hypotheses which Lie at the Foundations of Geometry*, Source Book in Mathematics, by David Eugene Smith, Dovers Publication, 1959, p. 422.

In the class that I gave on the subject of discoveries of principle in 1996 in Baltimore, I represented my own memory function of 12 different discoveries in a doubly-connected torus (Figure 7) representing the temporal eternity condition of my own mind measuring change within itself as a constantly changing memory function. Ironically, this experiment improves you memory capabilities.

Just imagine that the 12 numbers around the rim and listed under the torus represent twelve discoveries that you have made over a number of years. You can activate the torus of your own memory function by moving your finger clockwise starting at 1 (See Figure 8.) and follow the number of waves numbered on the edges as the series of residues of 6 (mod. 13) which reflect to the Poloidal/Toroidal ratio of 6 as a primitive root of 13.

The point here, however, is that the mind develops the same way as the Solar System does by composing discoveries of principle through a similar *analysis situs* in which each discovery causes changes to take place in every other discovery of principle. Therefore, it becomes necessary that what exists can no longer be considered as independent of position and must necessarily change axiomatically each time a new dimensionality is introduced. Change becomes identical with change in position and direction by means of measuring change through a multiply-connected complex motion. See my report [**THE LONG AND THE SHORT WAVES OF EQUAL AND LEAST TIME.**](#)¹¹

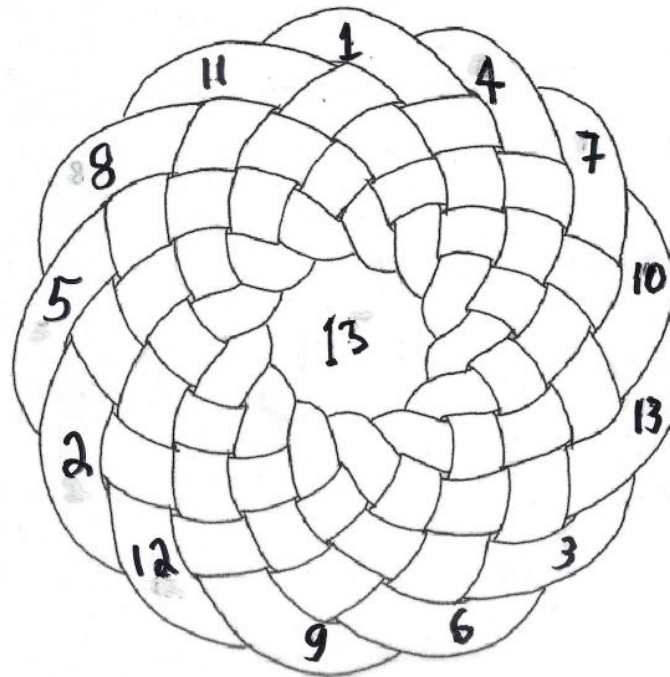
Figure 7 was the original drawing I made in 1996 in order to show how twelve of my own discoveries of principle, made during the years, could be located inside of a torus where each discovery increases in power as reflected in the geometry of the Theory of Numbers' primitive roots. The torus of Figure 8 below shows that 6 is a primitive root of 13, or 6 (mod. 13), when the torus geometrical ratio increases all of the powers of 6 Poloidal cycles over the Toroidal cycles of 13 waves; that is, when the ratio of increase in power of the torus is $P/T = 6/13$. Here, however, I must add the following correction.

¹¹See my report:

[http://amatterofmind.org/Pierres_PDFs/AXIOM%20BUSTING/THE LONG AND SHORT WAVES OF EQUAL AND LEAST TIME.pdf](http://amatterofmind.org/Pierres_PDFs/AXIOM%20BUSTING/THE_LONG_AND_SHORT_WAVES_OF_EQUAL_AND_LEAST_TIME.pdf)

Figure 7 contains an error I had made in 1996, by mistakenly adding “Eratosthenes 13” as a discovery. That was wrong because number 13 is not a residue like the other numbers. I only discovered this mistake now because I did not realize before today that the list of residues 6, 10, 8, 9, 2, 12, 7, 3, 5, 4, 11, 1, did not include number 13. So, always pay attention to what is not there.

If you look closely at that series and ask yourself what its ordering principle is, you will discover what number 13 actually is. You will discover that the ordering of the torus follows the principle of reciprocity. Aha! So, that’s what is holding everything together. Thus, 13 is the number of the 6 following sets of reciprocals: (12+1), (2+11), (9+4), (8+5), (10+3), and (6+7). That is the reason why 13 cannot be part of that ordering, because 13 is not a residue; 13 is the One of the Many!



1, 6, 10, 8, 9, 2, 12, 7, 3, 5, 4, 11, 1

Figure 8. Cyclical rotating cluster of TEMPORAL ETERNITY OF DISCOVERIES OF PRINCIPLE: Clockwise rotation of 6 as primitive root of 13, or 6 (mod, 13), when $P/T = 6/13$. All discoveries are reciprocals of 13.

- 1) Gauss, Poincot, Riemann (Torus of biquadratic residues);
- 6) Plato (soul of the World, Ontological paradox);
- 10) Theaetetus (Five Platonic Solids);
- 8) Roemer, Fermat (Speed of Light, Least Time);
- 9) Bernoulli, Leibniz, (Brachistochrone, Least Action Principle);
- 2) Roberval, Pascal, Huygens (Cycloid, Conics, Isochronicity);
- 12) Carnot, Monge, Poncelet, Steiner (Constructive Geometry);
- 7) Thales Theorem (Height of the Pyramid);
- 3) Cusa, Leonardo Da Vinci (Isoperimetric Theorem);
- 5) Kepler (Solar System Harmonic Field);
- 4) Raphael (The School of Athens, Transfiguration);
- 11) Bach, Beethoven, Mozart (Lydian Modality);
- 1) Gauss, Poincot, Riemann (Torus of biquadratic residues).

In Figure 8, each of the twelve discoveries have a reciprocal companion which, when added together come to a total of 13. Notice how well they are ordered two by two. Thus, it is the principle of time-reversal which establishes such reciprocity, as a preestablished harmony, because each discovery is affected by the power of all of the others in temporal eternity.

You can activate the torus by moving your finger clockwise and follow the number of waves corresponding to the series of residues located under the figure. Follow the poloidal number of waves indicated on the rim of the torus and count the waves until you reach the next number residue in the series. Complete the entire series until you get back to 1. The placing of the principles of discovery may change for different people, but the ordering of the numbers will remain the same.

The discoveries of principle are ordered according to the multiple powers of 6 with respect to 13; that is, according to the number of space-time Poloidal/Toroidal rotations between them. Therefore, 1 poloidal cycle of 6 units of action rotates to 6; then, 6 poloidal cycles of 6 units rotate to 10; then, 10 poloidal cycles rotate to 8, and so forth. The number of waves corresponds to the number of residues of P/T ratios added to each other, whereby each set of reciprocals is equal to 13. The next number to be expected by cyclical action resolves itself like a

musical dissonant Lydian spiral action which becomes resolved in classical musical composition as in Figure 11 below. The performative process of the temporal eternity cycle of discoveries is complete when the process of change comes back to its starting point 1; that is, when it is happy to get back to itself, after you have made a new discovery of principle, because you have improved the power of Relative Potential Population-Density as Lyn first discovered.

Similarly, as Plato stated about God creating the Soul of the Universe:

“And in the center he put the soul, which he diffused throughout the body, making it also to be the exterior environment of it, and he made the universe a circle rotating inside of a circle, one and solitary; yet by reason of its excellence, it is able to know itself, and needing nothing else but knowing and loving itself, it sufficed to itself. Having these purposes in view He [God] created the universe as a happy god.” (Plato, *Timaeus* 34b)

Plato might have added: this is how God created all souls, including the human soul.

THE AXIOMATIC CHANGE BETWEEN THE ARITHMETIC OF MAGNITUDE AND THE GEOMETRY OF POSITION

Are you ready to make an axiomatic change? Leibniz was the first to discover *analysis-situs*, and Poincaré, Gauss, and Riemann later provided the confirmation that Leibniz was correct. The primary condition for making such a discovery is to have the right disposition of mind for it, which is to be fully able to erase the axioms that prevent one from making such a hypothesis in the first place.

The crucial necessity of changing dimensionality resides in understanding numbers as units of action instead of magnitudes. This change enables you to go from a lower domain to a higher domain continuously because numbers can only be magnitudes when they are independent of position in space and time. Let me demonstrate how this change can take place:

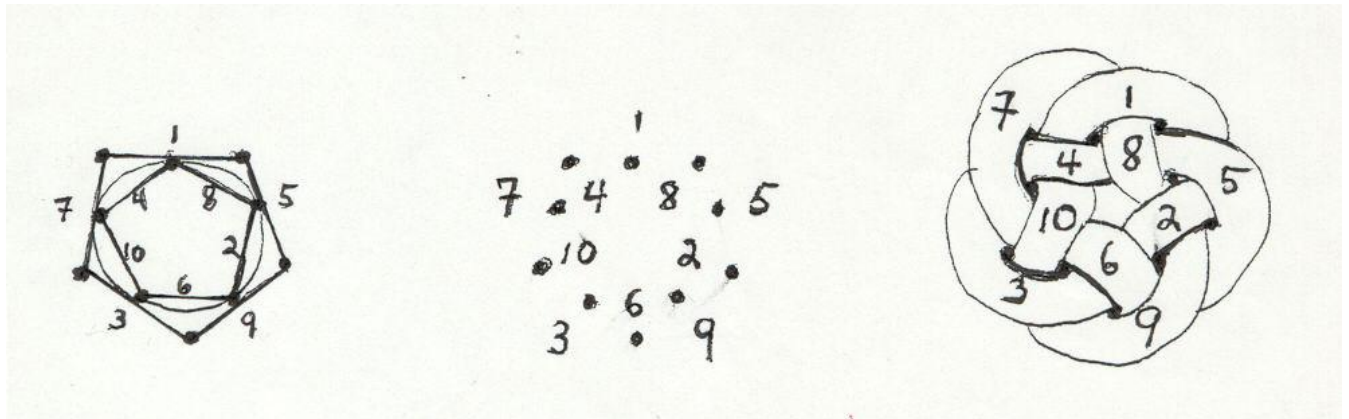


Figure 9. Axiomatic transformation between simply-connected circular action and doubly-connected circular action

It is impossible to construct the circle in any other way but by simple circular action, that is, by construction. However, the axioms of simply-extended circular action cannot break through the barrier of the circle to construct the torus. Only the addition of a second form of contrary circular action, independent of the first and coming from the proverbial outside and from above, can generate the coincidence of the two opposite motions into one; that is the torus.

Since there exists no possible geometry for things considered in themselves, that is, as self-evident entities or as magnitudes of self evident perceptions, the only way to solve that shortcoming is to eradicate the fallacy of considering numbers as magnitudes and consider them as units of action in accordance with their situation or position.

First, stop considering numbers as money that you are stacking up, because numbers have no intrinsic value. Similarly, human beings are not a collection of stupid things that keep bumping into each other in the night or who indulge in stupid competition with each other. Thus, from the vantage point of physical constructive geometry, consider that the ordering principle underlying prime numbers should not be sought for themselves, as such, but for the harmonic proportionality that lies among them and for the improvement of mankind by adding to the relative potential population-density of our species. It is essentially the harmonic relationships between human beings that define economic science,

just as it is the harmonic relationships of numbers that define the theory of numbers.¹² The same also applies to music.

GEOMETRY OF BIQUADRATIC RESIDUES AND LYDIAN SPIRALS

In his report on [*Time-reversal*](#), Lyn emphasized the musical aspect of the aesthetical effect of the Gaussian biquadratic hypothesis. He identified the process of time-reversal in mathematical economics with respect to the Gaussian discovery of principle of biquadratic residues. LaRouche wrote:

“The result is a shading of interpretation in the shaping of each interval of the composition, both within the individual voice, and across the polyphonic voices. The effect is of a slight deviation of the "physical space-time curvature" in the performance: conductor Furtwangler's doctrine of "performing between the notes."

“That must not be over-simplified. Each locality within the composition belongs to one among the sequence of polyphonic hypotheses, and must be so performed; but, that hypothesis must be affected in the shading of its performance by the proposition which locates the development process of the composition as a whole within the domain of higher hypothesis. The image of Gauss's development of, and Riemann's apprehension of higher implications of biquadratic residues, is forced to our attention, thus. In music, it is the ability to hear, to recognize, and to anticipate the distinction between appropriate and inappropriate shadings of difference of ‘curvature’ within the performance, which is crucial. In music, as otherwise, such music must be heard first in the mind, and, after that, what is heard so in the mind must command the instruments employed.

“Those differences in manifest ‘physical space-time curvature,’ are, relatively speaking, the more readily accessible feature of the principle of

¹² See my December 2006 report: [Microsoft Word - FERMAT'S GREAT THEOREM.doc \(amatterofmind.org\)](#)

‘time-reversal’: Its efficient presence can be measured so, whether in musical performance or physics as such.”¹³

Let me first emphasize the difference, here, between a biquadratic residue and a biquadratic complex number. A biquadratic residue is the remainder of a relationship of power between two numbers; in this case, 4 and 17 (See Figure 10), such that it can be expressed in mathematical terms as $4 \pmod{17}$. A biquadratic complex number is the result of a “shading of interpretation” in the subjective shaping of an interval of the composition as opposed to the counting of a magnitude.

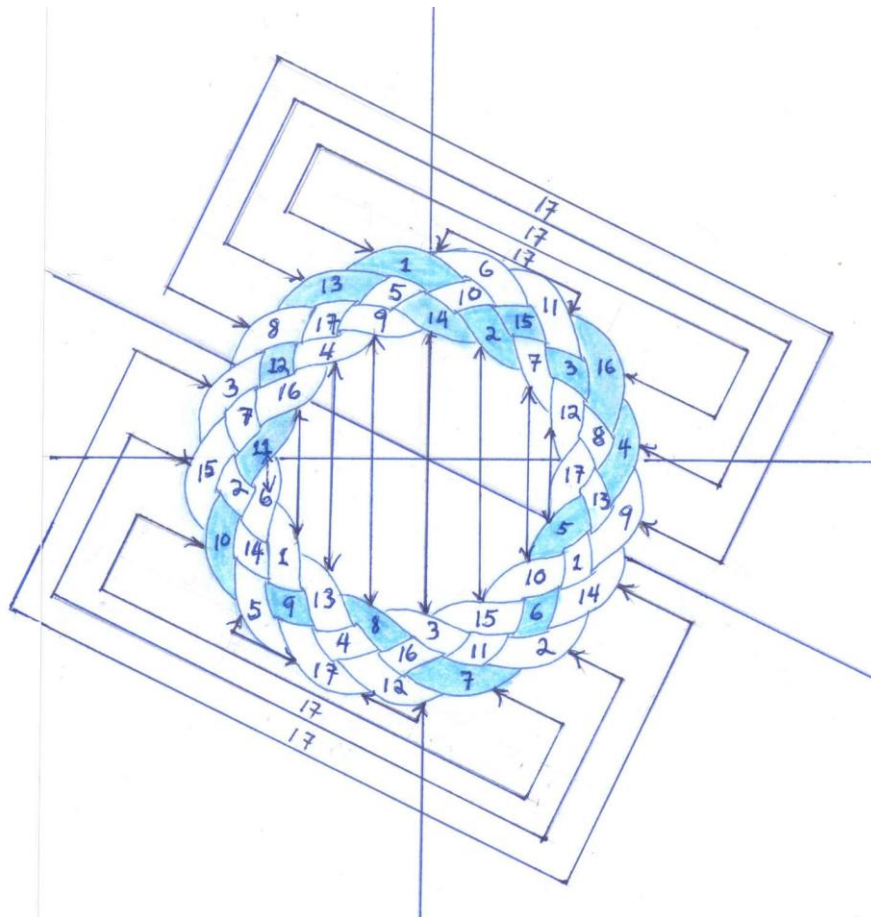


Figure 10. The four biquadratic residues of 4 (mod. 17): 1, 4, 16, 13. The two pairs of residues are reciprocals of 17.

¹³ Lyndon LaRouche, [*The essential role of ‘time-reversal’ in mathematical economics*](#), EIR, Vol. 23, No. 41, October 11, 1996., p. 40.

A musical example of time-reversal (Figure 11.) shows how a Lydian spiral transformation was introduced by Beethoven in his Sonata Opus 27, No. 2 [measures 35-36]. It is the higher hypothesis of this Lydian spiral which is the generative principle of this musical composition.

Moonlight Sonata 3

31

34

37

LYDIAN CLUSTER DISSONANCE

Resolution of DISSONANCE

LYDIAN CLUSTER

LYDIAN CLUSTER

LYDIAN CLUSTER

LYDIAN CLUSTER

The image shows a musical score for the first movement of Beethoven's Moonlight Sonata, measures 31 through 37. The score is written in treble and bass clefs with a key signature of three sharps (F#, C#, G#). Handwritten blue circles highlight specific melodic lines in the treble clef. Handwritten blue text annotations include "LYDIAN CLUSTER DISSONANCE" and "Resolution of DISSONANCE" under measures 31-32, and "LYDIAN CLUSTER" under measures 34, 35, 36, and 37. The number "3" is written in the top right corner.

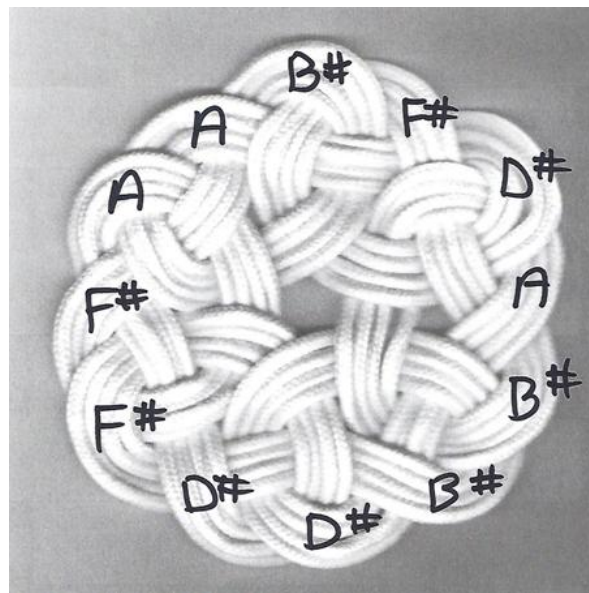


Figure 11. Beethoven Sonata Opus 27, No. 2, first movement, Lydian spiral of measures 35-36.

CONCLUSION: MEASUREMENT OF CHANGE AND AGAPE

In the last section of his paper on time-reversal, titled '*Riemannian 'time-reversal'*', Lyndon LaRouche developed his conception of "*measurement of change*" that he applied essentially to the domain of musical composition, but which he also ascribed to *Agape*. He wrote:

"Once more, return to our referenced musical example, to define the form of this set of relations. What is to be emphasized here, as in reference to this musical case in earlier published locations, is that the characteristic feature of Classical art is the evocation of *Agape*, by means of the rigorous subordination of art to that Platonic principle of Reason, the which is expressible only by the form of development which employs resolving transitions to new hypotheses of a relative higher cardinality than the utterance of the preceding hypothesis."¹⁴

How does *Agape*, or love of mankind, help you resolve the "transitions to new hypotheses of a relative higher cardinality"? Lyn answered this question by saying that one must find the progressive variation in physical space-time. In the creative process, there are only recapitulations which are never repetitions, but which lead into new steps of development: that's the *measurement of change* which has to be discovered. Here is the conclusive measure that Lyn left for us to internalize in the form of a question and that I hope you will also adopt:

"Employ this musical context to explore a deeper meaning of 'the future acting upon the present.' At first, the thought will be a stunning one; then, gradually, the initial shock of astonishment will give way to the consoling reassurances of Reason. 'When' is the future? At what point in time? Similarly, what is the beginning-point in time from which to define the cumulative past with which the future is to collide?"¹⁵

FIN

¹⁴ Lyndon LaRouche, [*The essential role of 'time-reversal' in mathematical economics*](#), EIR, Vol. 23, No. 41, October 11, 1996., p. 40.

¹⁵ Lyndon LaRouche, Op. Cit., p. 42.