From the desk of Pierre Beaudry

FUSION POWER IS NOT DEMOCRATIC

by Pierre Beaudry 2/16/2010

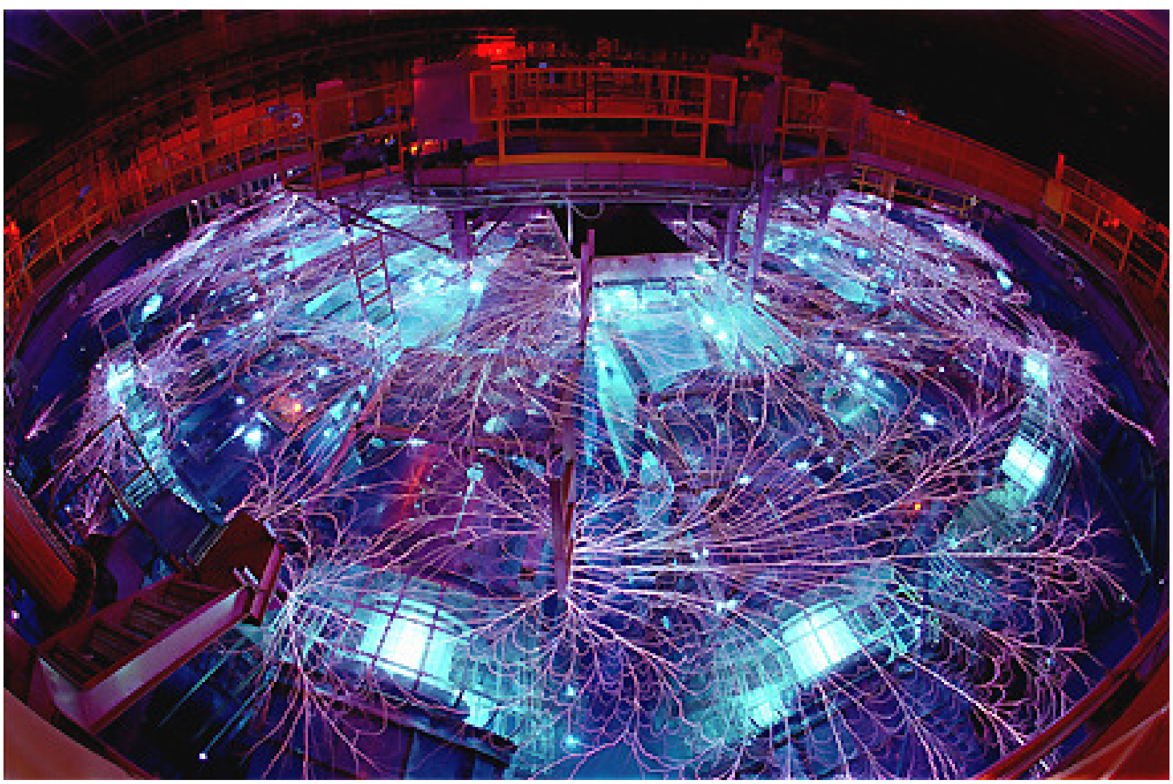


Figure 1. Z-Machine at the Sandia National Laboratories, New Mexico USA.

Fusion power has been looked at for a long time as the Holy Grail of energy consumers in the abundance of which everyone would share the power of the stars with everybody else, in a sort of universal communion, because it represents an unlimited source of cheap energy that everybody has a right to have, as if by birthright. As British reporter, Michael Paterniti, put it: "***Though left unsaid, the race for fusion has always been about democracy, or a democratic alternative***." (Michael Paterniti, ***A Machine called Z, The Observer***, Sunday 31 December 2000, p.5)

As a matter of fact, fusion power is not democratic at all; it is republican. The aim of fusion power is not to give man an improved material standard of living and an apparent new freedom to do what he wants. This is not the panacea of tomorrow that British oligarchism has been flaunting around the world in order to bring the suckers of the world under its gregarious control. Don't be a fool; democracy is entropic oligarchism, while fusion power is anti-entropic republicanism. The aim of fusion power is to increase worldwide the potential for creativity in mankind, per capita and per square mile of land area. The proof of this resides in a very interesting history-making dialogue that the American republican leader John Quincy Adams had with oligarchical British Agent, Jeremy Bentham, one day during a walk through Hyde Park and Kensington Gardens. Here is how this powerful republican singularity unfolded.

1- INFERENTIAL KNOWLEDGE VERSUS POSITIVE KNOWLEDGE

The difficulty that resides at the heart of discovering the secret of fusion power is made clear by John Quincy Adams while he was in England in his function as an American Minister to the Court of St. James, in 1816 and 1817. In the course of those two years, Adams had the opportunity to discuss religious topics with the notorious Jacobin democrat, Jeremy Bentham. Naturally, the question of the existence of God led to the fundamental question of the existence of matter itself. One cannot be answered without the other.

I quote here the entire two pages that Dean Andromidas reported in our Morning Briefing of Friday January 29, 2010, on the discussion which Adams had with Bentham on the crucial question of the relationship between knowledge and God, and knowledge and matter. Not only do the two types of knowledge referenced by Adams, here, relate to the two types of personalities, "**A**" and "**B**," identified by Lyn, but they also serve to establish quite beautifully the difference between republicanism and oligarchism in the most powerful manner as Leibniz had developed earlier. Adams wrote:

> "***It was the last morning walk I took with J. Bentham, and we went as usual through Hyde Park and Kensington Gardens. The written questions upon the state of religious opinions in America, and particularly upon the effect of avowed deism or atheism upon man's reputation and influence in society, with***

the answers I had given to them, formed the principal subject of our conversation. I perceived that my answers were not exactly such as he would have desired. He spoke with more reserve than usual, as if unwilling to shock prejudices which he had found rooted in my mind. The general tenor of his observations, however, was to discredit all religion, and he intimated doubts of the existence of God. His position was, that all human knowledge was either positive or inferential; that all inferential knowledge was imperfect and uncertain, depending upon a process of the human mind which could not, in its nature, be conclusive; that our knowledge of the physical world was positive, while that of the creator of it was inferential; that God was neither seen nor felt, nor in any manner manifested to our senses, but was the deduction from a syllogism, a mere probability from the combinations of human reason; that of the present existence of matter we have positive knowledge; that there was a time when it did not exist we assume without proof, for the purpose of assuming, equally without proof, an eternal Creator of it.

I observed in answer to it that inferential knowledge was in numberless cases more to be relied upon than what he called positive knowledge, meaning the mere testimony of the senses; that our knowledge of physical nature, such as it is, consists entirely of inferential corrections of the testimony of the senses. While we trust the positive knowledge of the senses, we must believe that the sun and the whole firmament of heaven move daily round the earth, and so stubborn are these cheating senses, that after they have been convicted of imposture, and when we know it is the revolution of the earth round its axis that produces all of these phenomena, we persist in saying that the sun, moon, and the stars daily rise and set, and it is only when we sit down to astronomical calculations that we discover the truth, the triumph of inference over the senses. I said that the proofs of intellect in the operations of the material world were as decisive to my mind as those of the existence of matter itself; intellect not residing in matter, but moulding and controlling it. What is that intellect, and where is it? Everywhere in its effects; nowhere perceptible to the sense. That this intellect is competent to the creation of matter I know, not from reason, but from revelation; but that it modifies and governs the physical world is apparent to my senses and my reason.

He replied little to this argument, apparently because he saw that my opinions were decided, and he did not whish for controversy…From the general tenor of his part in this conversation, and from several inconsistent remarks of his upon other occasions, I consider him as entertaining inveterate prejudices against all religions, and that he is probably preparing a book against religious establishments. If he had found my sentiments congenial with his own, I have no doubt he would have disclosed his sentiments more fully." (All emphasis are mine. John Quincy Adams, ***Memoirs of John Quincy Adams, His Diary from 1795 to 1848,*** edited by Charles Francis Adams, Philadelphia, J. B. Lippincott and Co, Vol.? 1877, p.464-5)

This discussion reveals why fusion power is not democratic, because ***inferential knowledge*** is the only form of anti-entropic knowledge capable of understanding the physical principle underlying fusion power; that is, by deriving its creative effects without passing through the detecting device of sense perception. In point of fact, the principle involved can only be understood as a paradox whereby, **"*intellect [is] not residing in matter, but [is] moulding and controlling it*."** In other words, we are confronted with the Keplerian question: "***How can mind generate matter without being of matter itself?***" The anomaly involved here is not merely a logical mediation, but an effective creative epistemological process which derives a real consequential physical effect whose causal coming into being happens to be formed outside of matter, therefore, exists without having any recourse to the trappings of sense perception. In that sense, as is the case of human justice, blindfoldness is an essential component of the creative process of fusion.

Here, John Quincy Adams has demonstrated that he was a student of Nicholas of Cusa and of Gottfried Leibniz. Adams understood that the purpose of ***inferential knowledge*** was a form of ***Learned Ignorance*** that gave man the Promethean power of anti-entropy, or even mastering anti-matter in some cases, because ***inferential knowledge*** itself replicates the process of creativity and demonstrates that the whole of science, up until now, has been based on the fraud of ***positive knowledge***. This means that if you want to harness such a power, you must be able to reproduce the principle of creativity in your own mind and summon its power in your neighbor's mind, proportionately, without relating to matter or to sense perception. However, ***inferential*** does not mean arbitrary; it means holding everything together analogically and coming to a valid conclusion from that standpoint. For instance, the principle of creativity of the human mind and the principle of fusion power must both be tuned to the same frequency of classical artistic composition, that is, to the well-tempered Bel Canto tuning of C-256, because the C-256 series is the only field in which you can fill all of the holes, hold everything together by their multiples, and subsume all of the singularities as a matter of course.

There is no magic to this. However, there is a chance that the MIT and Columbia University fusion scientists may discover the solution before everyone else with their Levitated Dipole Experiment (LDX), because they have understood that the natural vibrato in a dipole magnetic field has the ability to increase the density of the plasma in a natural manner, and without leaving any holes.

The director of the MIT experiment, Jay Kesner, reported last year: **"*Unlike the Tokamak design, in which the magnetic field must be narrowed to squeeze the hot plasma to greater density, in a dipole field the plasma naturally gets condensed*."** Kesner explains, ***"Vibrations actually increase the density, whereas in a Tokamak any turbulence tends to spread out the hot plasma."*** (***MIT tests unique approach to fusion power***, March 28, 2008.) www.physorg.com/news125929881.html

The next step, therefore, would be to compare the ***turbulence pinching*** to the process of Bel Canto register shift changes. Kepler was right, the heavenly spheres do sing quite beautifully with their aphelion-perihelion vibrato, especially between the magnetospheres of Jupiter and of the Earth. If professor Kesner considered that the investigation of the magnetospheres of the Earth and of Jupiter could be made more efficient in the LDX, and produce ***"a lot more subtle detail than you can get by launching satellites, and more cheaply,"*** think of how much greater the ironic economic results might be if the plasma were to be tuned in the same the Bel Canto method that you pour out of your soul during your morning shower. (David L. Chandler, ***Levitating magnet may yield new approach to clean energy*****,** January 24, 2010.)

2- DISCOVERING THE IMPORTANCE OF WHAT IS NOT THERE

On July 24, 1809, a former student of Lazare Carnot, Louis Poinsot (1777-1859), introduced in the first lecture he gave at the Paris Science Institute, the Leibnizian method of ***analysis situs***, for the purpose of grounding the geometric properties of numbers on a solid foundation. This axiomless playful form of geometry was characterized by Poinsot as a form of constructive geometry that excluded the Euclidean flat earth types of reductionist formal geometry taught in other schools at the time. In his opening statement to that class, Poinsot established the following Leibnizian principle of method. He wrote:

> **"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, like 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 ***Reflexions 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.)

The Leibnizian idea that Poinsot followed not only led him to discover two new regular solids, called the Great Dodecahedron and the Great Icosahedron, but also gave him the ammunition to fight the mediocrities of the flatland geometry of Euclid and of Euler. Thus, Poinsot contributed in overturning the ***a priori*** system of axioms, postulates, and definitions of what later became known in modern mathematics as ***topology.*** Instead, Poinsot developed the constructive Leibnizian method of ***analysis situs*** whereby the principle of a physical situation had to be included as an essential external component in the construction of physical geometric problems, but which was not determined by the internal motion of the objects themselves. He knew the situation had to be conducted by an outside causal agency performing from the inside of the process.

Moreover, from the standpoint of Lyn's epistemological ***axiom busting*** method, that Poinsot constructive method had the effect of a hand grenade thrown into the foxhole of Euler and his sycophants, during the early part of the nineteenth century, and it can be used, similarly, against today's pessimistic quackademic topologists who haunt the corridors of our universities. Poinsot made the point correctly about Euler's pessimism in his paper on number theory, reporting that the discouraged Euler had renounced all hopes of ever finding the answer to the question of discovering the ordering principle of primitive roots.

According to several accounts concerning judgments made by Euler on primitive roots that are to be found in his ***New Commentaries from Saint-Petersburg*** (Tome XVIII), Poinsot had said: "***Euler admitted that no means of determining these roots could ever be found; that the demonstration which proves their existence indicates, in all cases, that no method exists to discover them; that we cannot find any relationship between a prime number and the primitive roots that belong to it, and from which could be deduced at least one of those roots; that such a law, which rules them, seems to be as profoundly hidden as that which orders the prime numbers themselves***." (Louis Poinsot, ***Reflexions sur les principes fondamentaux de la théorie des nombres***, Paris, Bachelier, Imprimeur-libraire, 1845, p.75.) Poinsot was thus also self-consciously reminding us that the principle for discovering such an ordering principle is open-ended like a memory function; that is, ***finite but unbounded*** as Einstein reminded us the universe itself was. The fact that Poinsot had used the same method of ***analysis situs*** to warn future generations against the pessimism of Euler merely served to confirm the universality of the underlying principle he was using.

For example, the principle was used by Mazarin as the primary means of his negotiations at the Peace of Westphalia. This was the same principle of proportionality that Gauss had established as the basis for congruence among counting numbers that he formulated in the first proposition of his ***Disquisitiones Arithmeticae.*** In a nutshell, the idea is expressed by the fact that a number, C, is congruent with two other numbers, A and B, when it eliminates the difference between them. Similarly, Mazarin recognized that a lasting European peace could not be achieved unless the power diplomacy of the Netherlands was to succeed in eliminating the difference between France and Spain.

From the vantage point of this Leibnizian method, Poinsot concluded that the numbers of primitive roots of any prime number P are those which remain after the squares, the cubes, and the fifth powers, etc., have been extracted from the intervals of action of the module P-1. Poinsot gave the example of prime number 61 taken as a module. Since the number immediately preceding 61 is P-1, that is 60, it is clear that the simple factors of 60 are 2, 3, and 5. Poinsot showed that any other multiple could be broken down into these three simple factors, up to the 60^{th} power. That being the case, he excluded all of the squares, the cubes, and the fifth powers. By eliminating the powers of two from 60, he was left with 30. By eliminating the third powers from 30, he was left with 20, and by eliminating the fifth powers from 20, he was left with 16. Therefore, after this playful exclusion of the superfluous power factors, there were only 16 primitive roots of P = 61 left, which were ironically held together, invisibly, by what was not there, just like prime numbers are held together by the missing simple factors, as I have shown in a previous ***analysis situs*** pedagogical. (Pierre Beaudry, ***TOWARDS UNDERSTANDING THE SCOPE OF PIERRE FERMAT'S "GREAT THEOREM" OF LEAST ACTION,*** 2/10/2006.)

The conclusion of Poinsot was as simple as it was elegant. He stated: "***When you wish to find them (*****prime numbers*****), one considers all of the simple factors of a given number; and from the natural series 1, 2, 3, 4, 5, etc., one excludes all of the multiples of these simple factors. Here (*****with primitive roots*****), instead of those multiples, it is necessary to exclude all of the powers of exponents identified by these factors: the result, as one can see, is an operation of the same type, except from a higher level.***" (Louis Poinsot, Op. Cit., p. 75.)

But, where is that higher anti-entropic level piercing from? How do you access the domain of the universal physical principle that shines through the cracks of the mere quantitative power shadows here? That is the question that remains to be unseen. What is this underlying process showing us with respect to cosmic radiation, for instance? What sort of measuring rod is Poinsot indicating here with respect to residues of powers? He is not simply pointing to a mere quantitative, but also qualitative higher level of discontinuity. Thus, the Poinsot method of ***analysis situs*** was not only a playful geometric game, but it was also meant for solving anti-entropic axiomatic problems as determined by the function of their location or situation, that is to say, problems defined by a higher physical mode of existence and with an appropriate constructive geometry ***within the physical and historical context of that higher existence.***

3- CHANGING THE BOUNDARY CONDITIONS.

There are things in the universe that have the appearance of being so certain and so self-evident that you would consider to be a complete fool anyone who would put them under the scrutiny of doubt. Well, I am such a fool and I will demonstrate to you that the idea you have of the quadrature of the circle and of ordinary counting numbers is so false that you will wish you had changed your mind as to what you misunderstood them to be. In point of fact, there exists for each counting number a specific underlying process of action that makes its behavior either ***continuous or riddled with discontinuities***. So, if you were to approach the question of quadrature or of counting numbers from the vantage point of the Leibniz ***principle of continuity***, you would understand why you had to change your view on such self-evident subject matters.

As for understanding the value of counting numbers, for example, the first thing you must do is to consider them as mere ***shadows of physical action in the universe***. In that sense, counting numbers are inferential. In other words, you must eliminate from your mind the false underlying assumption that numbers represent self-evident entities in and of themselves. Like in the case of dollar bills, the value of numbers is not a self-evident thing, but infers some productive power behind them. Considered from a higher standpoint of value, numbers are not what they appear to be at all, especially when you get them to do some work for a change. And, the first change that must be applied to understanding counting numbers is to consider them as ***intervals of action*** as opposed to ***fixed quantities***. If you do that, numbers will turn out to be something completely different from what you thought they were. Therefore, if you eliminate from your mind this absolute ***fixed quantity*** notion of sense perception, you will be able to discover that the underlying properties of counting numbers are truly inferential in the sense that they are based on the analogical proportionality of toroidal motion. Let's illustrate this with an elementary example.

Let's do a thought experiment and find out what happens when you want to transgress the elementary epistemological flatness of the circle. This mental change in the domain of epistemology, which occurs by going from a ***fixed quantity*** to an ***interval of action,*** implies a physical change in the geometry, as if the production of mathematical discontinuities were resolved by going from the circle to the torus. For example, take number 5 and think of each of the 5 units as the 5 sides of a pentagon. How can you conceive of the 5 sides of a pentagon as shadows of 5 intervals of action? First, ask yourself why are the numbers 1 to 10, in Figure 2, in such weird places? What is the significance of the two sequences 1,5,9,3,7, and 2,6,10,4,8? If your answer is to relate to them as odds and evens, you are wrong, because you are looking at the elements from the standpoint of the circle, not from the torus. Your looking from the bottom up, not from the top down.

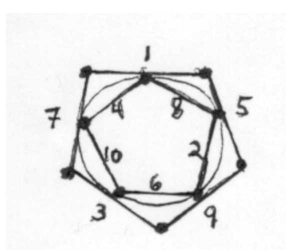


Figure 2. Circle inscribed and circumscribed with pentagons.

Circumscribe and inscribe a circle with pentagons, and note the discontinuities between the circle and the two pentagonal figures, between curvature and linearity. That is the first incommensurability that you have to solve. This relationship between polygons and the circle represents a mathematical discontinuity that says you cannot square the circle by inscribing and circumscribing it with greater and greater polygons. This reflects the impossible quadrature of the circle as Cusa demonstrated it by pointing to the axiomatic error of Archimedes. The question that arises is: how can you solve this impossible mathematical quadrature? It cannot be done mathematically. Non-linear equations cannot do it because they are fake. It can only be done by a physical transgression. You might say: "Hey! You can't do that." And, I will reply: "Why not, the creativity of the physical universe does it all the time, and so does the creative imaginative mind of man, especially in the domain of classical artistic composition."

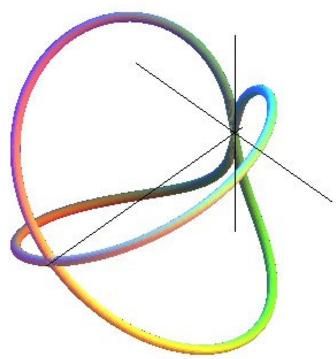


Figure 3. The biquadratic Archytas bold curve pathway caused by the intersection of a zero degree torus and a cylinder. © Robert FERRÉOL , Jacques MANDONNET 2005.

What you need to do is what Archytas did in discovering a solution for doubling the cube; that is, he discarded things in themselves and considered that there might be a way to accomplish the transgression of the quadrature of the circle in a lawfully ordered way; that is, by creating several entirely new ***bold curved pathways***. It was the intersection between the torus-cylinder curve pathway and the cone-cylinder curve pathway that gave him the solution to the doubling of the cube. In other words, Archytas changed the old rules of the game by transforming the ***limiting boundary of the circle*** into an integrated composition that included cylindrical, toroidal, and conical actions. By doing that, he treated multiple circular actions as means of transforming the limiting circle into a new form of ***transitional boundary condition*** from the vantage point of a higher dimensionality**.** This is how Lyn put the problem before us last weekend:

> "Archimedes bought into the idea of the quadrature of the circle, and then of the parabola. Which is wrong. Contrary to that is Eratosthenes; contrary to Plato; contrary to Archytas. Now, how did he double the cube, duplicate it, directly? By what method? By a mathematical method? No. By going through different series of curves. So, it's a process of integrating what seem to be a series of elements as a single unifying process of transformation, which is what is real

physical science. What is anything in art, what is creativity? The ability to transform things which are separated by discontinuities, which is what quadrature is. What is quadrature if not an infinite, endless process of singularities? It's mathematics; its not physics. Physics is what we do, very simply, in replicating Archytas' constructive generation of the duplication of the cube, as this was qualified again later by Eratosthenes." (**NEC/LYM MEETING WITH LYNDON LAROUCHE, FEB. 13, 210.** See also my report: Pierre Beaudry, ***The Egyptian Pyramid and theArchytas Doubling the Cube,*** 9/15/2009.)

So, how can you do the equivalent of what Archytas did, with ***analysis situs***? How can you go to the next higher dimensionality from the axiomatic limitations of the flat circle and polygons? As Lyn has shown, this cannot be done by ignoring or smoothing-out the mathematical discontinuity, and accepting the paradoxical quadrature of the circle as a ***fait accompli***. You must leave the domain of mathematics altogether and proceed to the domain of physics, as Riemann called for mathematicians to do in the very last sentence of his Doctoral Dissertation. It must be the creative process of reality that bridges the discontinuity gap of mathematical limitations, not mathematical equations. How can this be done? Use your imagination. This is where the Leibnizian ***analysis situs*** comes in to help you make that leap of discontinuity.

If the elementary ***analysis situs*** of the circle is incapable of breaking through the limitation posed by the mathematical singularity of the quadrature, then, you must add a higher dimensionality to your ***analysis situs***. That's all. The only way to resolve this incapacitating situation is to introduce the higher geometry of the torus or of the sphere. Here is how you can visualize this epistemological transformation. Just imagine you are counting the number of sides of the two pentagons, from 1 to 10, as if you were going in and out of the circle, from the outside of the circumscribed pentagon to the inside of the inscribed pentagon, that is to say, as if you were piercing though the barrier of the circle.

This is the kind of thing that living cells do all the time when they grow. So, pierce through the circle and the pentagons, but keep the 10 vertices of the inscribed and circumscribed polygons as the footprints of the animal you left behind to remind yourself that you are leaving the habits of an old animal in order to create new habits in the skin of a new animal of higher dimensionality. Now, you can play the game of filling in the holes left by the intervals of action of the torus with only the shadow memory of the edges, the vertices, and the circle. Here is the playful two-step transitional boundary construction. (Figure 4)

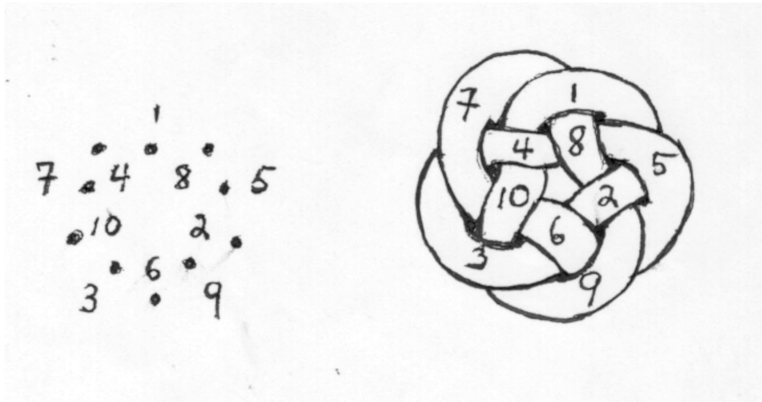


Figure 4. Torus curvature subsuming the failed quadrature of the circle.

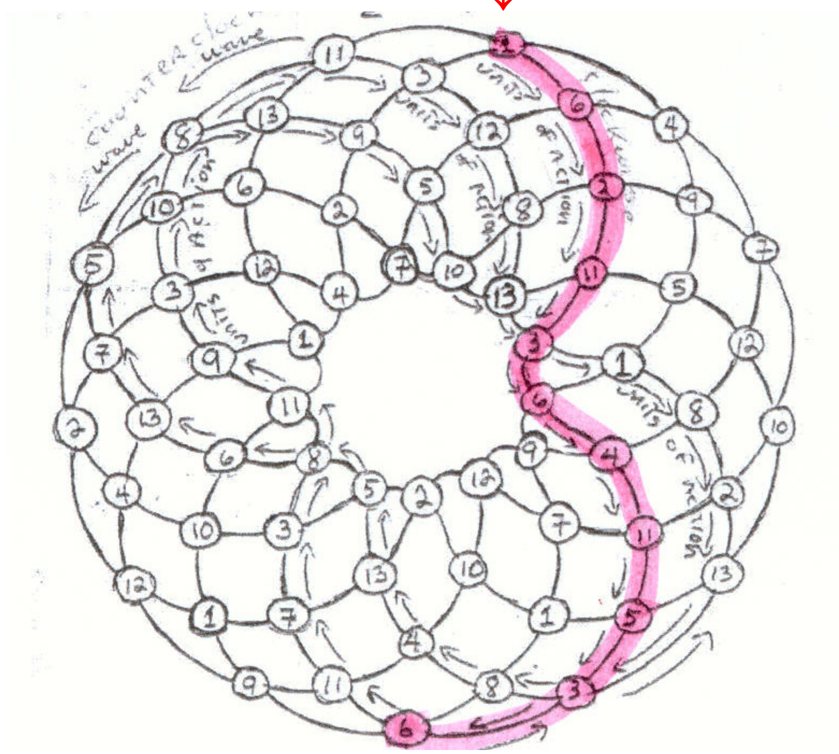
Insert the two sets of pentagonal values of 1 to 10 into the torus-like formation as in Figure 4, and think of their numbers only as rotational ***intervals of action***. That's all there is to it. You are no longer counting things. Do you see the difference? What are the implications and significance of this ***axiomatic change***? One implication is that if you apply the same treatment to any of the number elements composing the power of 2 series of C-256, such as 4,8,16,32,64,128, and 256, etc., you will discover that this is the only power series that subsumes all of the singularities by filling-in all of the holes of the ***analysis situs*** pathway of the torus. Another implication is that you can discover the underlying geometric ordering of primitive roots that Euler claimed could never be found.

4- THE *ANALYSIS SITUS* UNDERLYING ORDERING OF PRIMITIVE ROOTS.

The following exercise is a playful game very similar to what Poinsot had constructed in number theory by means of the Leibnizian method of ***analysis situs***, but which raises epistemological questions adapted for a student investigating the creative behavior of fusion processes. The point is to demonstrate, by a physical geometric construction alone, the ***analysis situs ordering*** of primitive roots that Euler had declared impossible to establish. There is a very flavorful irony, here, which shows that numbers are mere shadows of physical geometric processes, and where you must let the physical geometric intervals do the calculating. You can discover this by letting the ***analysis situs*** do the counting for you, that is simply by letting your finger do the rotating. The following is the general theorem for the ***analysis situs*** of primitive roots:

If you have P poloidal wave intervals arranged in a torus, and you join them into a continuous motion from h to h, h being a primitive root of P, you will necessarily pass through all of the P intervals before returning to your starting point, and you will necessarily have covered the toroidal circumference of the torus h times $\frac{P-1.}{2}$

Start from here. ↓



And go to here, ↑**, and then…**

Figure 5. ***Analysis situs*** of 6 as a primitive root of 13. The torus is constructed with a poloidal circumference of 6 units of action and a toroidal circumference of 13 poloidal waves. The underlying ***analysis situs*** of 6, module 13, can be discovered by identifying each residue as the number of poloidal waves required to reach the next residue in the sequence. There are four primitive roots of 13: they are 2, 6, 7, and 11.

This ***analysis situs*** game is played in the following manner. Given that 6 is a primitive root of 13, fill in the holes with the appropriate numbers such that all of the units of action and waves, (1),(2),(3),(4),(5),(6), …(13), which are required to be filled five times, cover entirely the surface area of the torus, starting from point (1) and returning to the same point (1), as shown in Figure 5. The way to develop this process is to proceed by counting physical waves moving along the surface of the torus and overlapping one another in a braided fashion, rotating clockwise, one poloidal wave at a time, and as many times around the entire toroïdal circumference of the torus as necessary, starting with the unit poloidal wave of (1) to (6), and continuing around the torus until all of the residues are identified before returning back to your starting point.

The question is: how are you able to identify the residues without calculating their powers? Each residue is the shadow multiple of a poloidal wave of (6). In other words, the first wave takes you from (1) to (6); the next six waves take you from (6) to (10); the following ten waves take you from (10) to (8); and the next eight waves takes you from

(8) to (9); and so forth. The residues of 6, module 13, are in the ordered sequence: 6,10,8,9,2,12,7,3,5,4,11,1.

The difficulty resides in defining the significance of the power of each poloidal wave when you are attempting to locate what is not there. I suggest you think of the residue not as an arithmetical entity, but as the amount of work that remains to be done in the torus before completing the work. So, the idea is to go from the physical work representation of the toroidal wave, that is, from its working chemistry to the mathematical representation of the residue, which is merely its shadow. Bear in mind that you are not looking for a mathematical result here, but for the cause of an epistemological-physical process that is open-ended to a next unknown step into the future. Like in a planetary orbit, you don't know what tomorrow will bring, but you know where it will take you. In other words, you define the residues as if the physical process of the ***analysis situs*** had already counted them for you in principle; as if the underlying ordering process had already been set under a single unifying principle, independent of the distribution of its elements, and without having anything to do with the mathematical power calculations. Look Ma, no math! Just playing round outside in the backyard with the pathway of a planetary system.

If you wish to further test your skills, here is a problem that is a variation of the previous exercise: ***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 wave-intervals of the knotwork with the appropriate residue in that ordered sequence. Fill-in only the outside holes of the knotwork, starting with (1), anywhere you wish on the outside surface of the torus.*** (Figure 6)

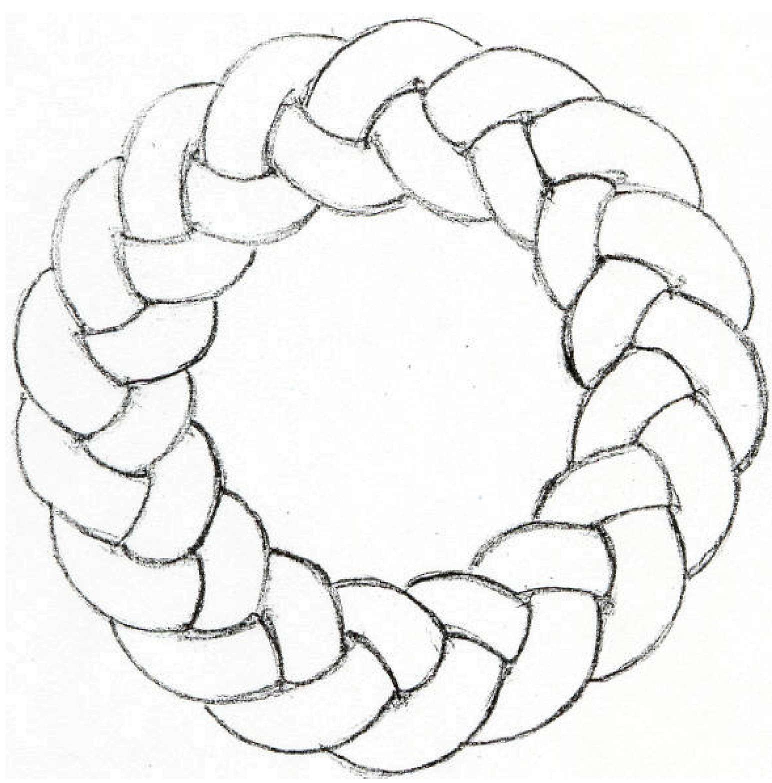


Figure 6. ***Analysis situs*** of a torus knotwork with a toroidal circumference of 17 and a poloidal circumference of 3. Discover the underlying ***analysis situs*** of 3 module 17 simply by identifying the residues as shadows of poloidal waves. The eight primitive roots of 17 are: 3, 5, 6, 7, 10, 11, 12, and 14. If you wish, you can send your results and comments back to pierrebeaudry@larouchepub.com

This ***analysis situs*** experiment is as close as I can get to express, in a playful game form, a particular sort of axiomatic change occurring in the boundary condition of the shadowy domain of numbers, and by means of which a universal physical principle can make its existence known between the different peaks of the ascent. However, the point is that this ***analysis situs*** process is not mathematical topology; it is non-entropic motion in physical space-time. As Lyn put it succinctly: ***"The Progress of the successful student, is not from mathematics to physics, but from physical chemistry to the important, but subordinate role of the shadow-land called mathematics."*** (Lyndon H. LaRouche Jr., ***We are a Republic Not a Democracy***, Unproofed for internal use only, January 23, 2010, Morning Briefing, February 7, 2010.) The implication here is that with fusion power, there is an underlying process that generates higher and higher energy throughputs: so the question is, what is the underlying ***analysis situs*** that generates it?

5- THE NEED IS TO AVOID QUIXOTIC IMBECILITY

Now, compare this Leibniz-Poinsot method of ***analysis situs*** to that used in the work on the Z-Machine in New Mexico:

> ***"Thus the world inside the Machine is driven down to its smallest, most maddening detail. For in the end, fusion - its possibility and reality, its attainment and capture - comes out of this finely tuned call-and-response with the universe itself, the channelling of some great unknown, copulating force that calls for the perfect alignment of human and Machine. That is, the human culture surrounding the Machine attempts to mimic the Machine itself , which is trying to mimic the universe. The mannerisms of the Machine become the mannerisms of its minions - people rage and tyrannise, overheat, relent, synergise, procreate, vanish, and recur. One idea seems brilliant and fails, while another may start as a quail but then, compressed by other ideas - electrons stripping off, ions colliding - transforms into something sharp and fast, something agitatingly beautifully, right. And then, of course, it is shot into the Machine to see if it is." (The Observer, p. 4)***

As a consequence of all of this insanity, Dr. Gerald Yonas, Director of Research at the Sandia National Laboratories, had to admit to the almost complete failure of their method, and concluded that if the project was still alive today, it was due to the fact that the Z-Machine was gracious enough to give the proof of the principle of anti-entropy of the creative process of the universe instead of responding in kind to the animalistic behavior of the scientists. Yonas wrote:

> "***Some things never change--or do they? In 1978 fusion research had been under way almost 30 years, and ignition had been achieved only in the hydrogen bomb. Nevertheless, I declared in Scientific American at the time that a proof of principle of laboratory fusion was less than 10 years away and that, with this accomplished, we could move on to fusion power plants [see "Fusion Power with Particle Beams," Scientific American, November 1978]. Our motivation, then as now, was the knowledge that a thimbleful of liquid heavy-hydrogen fuel could produce as much energy as 20 tons of coal.***
>
> ***Today researchers have been pursuing the Holy Grail of fusion for almost 50 years. Ignition, they say, is still "10 years away." The 1970s energy crisis is long forgotten, and the patience of our supporters is strained, to say the least. Less than three years ago I thought about pulling the plug on work at Sandia National Laboratories that was still a factor of 50 away from the power required to light the fusion fire. Since then, however, our success in generating powerful x-ray pulses using a new kind of device called the Z machine has restored my belief that triggering fusion in the laboratory may indeed be feasible in 10 years."*** (Gerald Yonas, ***Fusion and the Z Pinch*, *Scientific American*,** August 1998, 6 pages.)

Thus, the crisis in fusion research today has brought us before the evidence that the creative process of the universe itself must reflect the process of human creativity by the unseemly way of abandoning the positive illusion of sense certainty. This is not simply a matter of throwing out the garbage, but also a matter of appreciating the significance of acquiring a cognitive quality of knowledge from what is not there; something quite similar to the discovery of Archytas in his construction for the doubling of the cube. This condition means that no one should be allowed to fall into the trap of quixotic imbecility of sense perception any more. Two questions must be raised and answered: first, how can the fire in the mind of the scientist and the fire in the mind of the stars reach the same higher level of energy-flux density? And the second, why is it that the Adams and Leibniz method of ***inferential knowledge,*** rather than ***positive knowledge*** is the only method that can lead to breakthroughs in mastering fusion power?

Leibniz proposed a definite pathway which shows how to muster the required power and how, in the progress of which, one must eliminate the superfluous, clean out the overflow of non-congruent matter, and throw out everything that is banal and mediocre, as Cusa had done in discovering the power of ***Learned Ignorance***. As the case of the immortal efficiency of ideas shows, discoveries of universal physical principle tend to be more efficient when unencumbered with the physical domain, yet, they are only efficient inside of the physical domain. Once that ontological paradox is understood and resolved, what you are left with is the most extraordinary balance of proportionality that connects reason with power, which is located, for instance, in the very foundation of the

American Republic. Here is how Leibniz formulated this republican requirement as the common heritage of mankind:

> "***All beauty consists in a harmony and proportion; the beauty of minds, or of creatures who possess reason, is a proportion between reason and power, which in this life is also the foundation of the justice, the order, and the merits and even the form of the Republic, that each may understand what he is capable, and capable as much as he understands. If power is greater than reason, then the one who has that is either a simple sheep (in the case where he does not know how to use his power), or a wolf and a tyrant (in the case where he does not know how to use it well). If reason is greater than power, then he who has that is to be regarded as oppressed. Both are useless, indeed even harmful. If, then, the beauty of the mind lies in the proportionality between reason and power, then the beauty of the complete and infinite mind consists in an infinity of power as well as wisdom, and consequently the love of God, the highest good, consists in the incredible joy which one (even now present, without the beatific vision) draws out of the contemplation of that beauty or proportion which is the infinity of omnipotence and omniscience*.**" (Gottfried Leibniz, ***Outline of a Memorandum: On the Establishment of a Society In Germany for the Promotion of the Arts and Sciences (1671)***, in ***The Political Economy of the American Revolution,*** EIR, 1995, p. 215-16.)

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