AN UNFINISHED BUSINESS…

KEPLER'S SOLUTION TO THE CREATIVE PROCESS

Revisiting the "***Strong Hypothesis***" on the birthday of Lyndon LaRouche

By Pierre Beaudry, 9/8/16

FOREWORD

Twenty-nine years ago on his birthday, September 8, 1987, Lyndon LaRouche wrote an internal memorandum called: ***THE 'STRONG HYPOTHESIS' OF BIOPHYSICS***, in response to some questions that Dr. Sidney J. Webb, M.D., had posed with respect to his research on "***Nonlinear Phenomena in Bioenergetics and Oncology***."

A month later, on October 16, 1987, Dr. Wolfgang Lillge, M. D. wrote an article on the same subject in EIR, in which he stated: "We are still very much in the dark about what actually causes a normal cell to become a cancer cell, with all the implications that has." The point Dr. Lillge made was that the greatest obstacle to discovering a cure for cancer had not been the lack of funding or the lack of investigators in the field of cancer research, but was located in the deductive nature of the epistemological method of scientific investigation itself.

The time has now come to reopen this investigation with a new look into how Kepler had solved this deductive problem with constructive geometry by using the LaRouche method of multiply-connected spiral action by time reversal.

INTRODUCTION

"Given the property of the action, find the curvature."

Dehors Debonneheure

As Lyn has been emphasizing for years, Johannes Kepler was the first modern scientist to adopt Nicholas of Cusa's Minimum/Maximum least action method of applying the creative human mind to his knowledge of the universe in the large as well as in the small. Lyn was also the first to acknowledge the epistemological importance of this Microcosm/Macrocosm application for modern science by emphasizing the necessity to focus the investigation on ***THE 'STRONG HYPOTHESIS' OF BIOPHYSICS.***

The pathway that Lyn proposed we investigate related to the musical domain, in a broad sense, because the frequencies of the lower electromagnetic spectrum had to resonate like the Lydian harmonics of the frequencies of the galactic domain as a whole. In other words, our task is to discover how similar harmonic proportionalities are common to both orders of microcosm and macrocosm. This means that the universe, in the large as in the small, had to use the same constructive geometry of least action.

In this report, I will demonstrate that Lyn's idea of a constructive geometric system of complex spiral action reflects a performative system of action which is in opposition to the deductive system of thinking. The reason for taking such an approach is based essentially on the fact that the supreme goal of a constructive geometric system is to effect a change in the world as opposed to simply giving it a self-evident interpretation, or an explanation.

My intention, here, is not to get involved in the discussion Lyn had with Webb in 1987, but to discuss the matter of how science can and must performatively change the world today. This means that performative constructive geometry must be understood as the crucial means of eliminating liberalism and the flaws of its deductive form of thinking.

1. LYN'S DIALOGUE WITH DR. SIDNEY J. WEBB.

Since the human body is made up of about 10 trillion (10^{13}) living cells and it has to replace an average of about 10 million cells per second in order to make up for the lost of dying cells, there is an urgent need to know how the constructive geometry of cell reproduction behaves during the changing process of the aging of living tissues.

The point of interest, here, is not the death rate of cells, as such, but the harmonic least action proportionality between microcosm and macrocosm of cell generation in the human body; that is to say, the constructive geometry of the metabolic process of change between the total volume of cells in a given growing body and the metabolic process of change inside of each single cell as a reflection of the process as a whole. Such a healthy process must be investigated from the vantage point of continuous least action change in the system as a whole, and without consideration of any ***discreteness*** (visible manifold) and ***linearity*** (mathematical straight line measurement). As Lyn put it:

> "All notions of axiomatic discreteness of "matter" are excluded; this elimination of axiomatic discreteness forces us, as Kepler exemplifies this for the foundations of comprehensive modern forms of mathematical physics, to eliminate the relatively distinct notions of [?], and to introduce [?] instead. It is to be emphasized that Cusa's 1440 [?] already establishes a true "non-Euclidean geometry," one entirely distinct in notions of method, as well as axioms and postulates, from the deductive system of [?]. This non-Euclidean (constructive) geometric method, premised upon no assumption but the principle of least action, is the underlying distinct [?] in method within the more fundamental qualities of work of Pacioli, Leonardo, Kepler, Desargues, Fermat, Pascal, Leibniz, Gauss, Riemann, et al.
>
> In geometry, as in the elementary form elaborated by Professor Jacob Steiner et al., the existence of "points" and "straight lines" is constructed, thus eliminating all assumptions of [?] and [?] embedded in all deductive

method. Circular action suffices to generate both of these linear forms from nothing but continuous circular action; both points and straight lines appear as being generated by continuous least action." (Lyndon LaRouche, ***The 'Strong Hypothesis' of Biophysics.***)

One of the non-linear singularities that Dr. Webb has found with this method may well have been by investigating the behaviour of such Kepler harmonics in the progress of cell life when the cell requires an increase in energy-flux-densities. I presume this is what Dr. Wolfgang Lillge meant when he wrote in his EIR article:

"Webb concludes from this that because these lines move to higher and higher frequencies as the cell progresses through its life cycle, each successive metabolic step requires a higher energy input; thus, higher and higher energies must be directed to given areas of the cell as it ages. And after an asexual division of the cell, the daughter cell will not start its own cycle *on* the original oscillation of the parent generation, but with those of the next higher harmonic.

"On that basis, Webb presented the hypothesis that asexual cell division may have a definite limit at some point where the energy requirements of the cell become too large, and thus there arises a need to lower the energy requirement to some basic level. This may be achieved by the sexual reproduction cycle of cells in which an exchange of genetic material takes place.

"Although there are no data yet available to back this hypothesis, it would be interesting to know more about the corresponding behavior of cancer cells. Based on Webb's results, one would expect that the uncontrolled growth of tumor cells has something to do with the way energy is utilized within the cell. Warburg's cancer theory already implied that cancer cells represent a regression to the lower evolutionary state of anaerobic glycolysis." (Wolfgang Lillge, ***Toward cancer progress through optical biophysics***, EIR, October 16, 1987, p. 24.)

The mystery of this increase in energy-flux-density may be found in what Webb showed in his experiment of Raman spectroscopy where the use of water in microwave ovens is conveniently used to kook food. However, what we are looking for is not some effects detectable by increase in temperature, but by increase in the density of singularities per unit of action.

2. THE CUSA LEAST ACTION PRINCIPLE OF MINIMUM/MAXIMUM

Why are living or thinking processes not geometrically constructible in visible space-time (the discrete manifold)? Because their boundedness, that is to say, the Golden Section of the Five Platonic Solids cannot be constructed "visually" as an intelligible representation beyond visible space-time. A jump must be made beyond the domain of the visible into the transfinite manifold of a scientific/artistic domain and a higher form of expression of the Golden Section must be constructed, which is what the Ecole Polytechnique of Monge and Carnot had called the "***Sentiment of Enthusiasm***."

This next higher step requires an effective interdependency of microcosm and macrocosm (minimum/maximum) as established by Nicholas of Cusa. Another way to state this is to say that an effective application of the interdependency of microcosm and macrocosm, as developed, for example, by Tony Peratt for plasma processes, cannot be constructed geometrically in visible space-time, because it cannot be conceived deductively; it can only be generated, performatively, within the scope of the laboratory.

In other words, living and thinking processes cannot be constructed as visual geometric representations; they can only be performed as ***intelligible isochronic least actions of change in the simultaneity of eternity of negative curvature***. Such a mental manifold of space-time is a form of constructive geometry which reflects a performative force-free least-action that goes beyond the boundedness of the visible domain altogether, and which must use both scientific and artistic compositions to convey the higher geometries of the mind and of human emotions

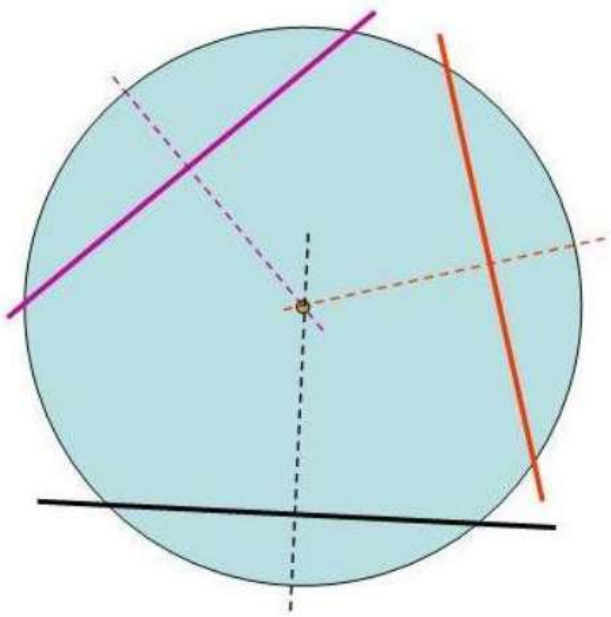
as Schiller understood them. See my last report: **THE CHINESE UNITY OF QI, LI, AND TAIJI IN THE SIMULTANEITY OF ETERNITY**.

The Kepler snowflake paper is a good example of this higher transfinite process. As Kepler demonstrated in that paper, science must go beyond the mere description of natural phenomena; it must act to effect a change in the minds of thinking people as well.

3. HOW IS A PROOF BY CONSTRUCTION ANTI-DEDUCTIVE

A deductive proof is the result of a logical process whereby the conclusion is already presupposed in its premise. As Lyn put it: "All deductively consistent systems of hypotheses and theorems in a formal logic are merely giant tautologies, subsumed everywhere, within each particular system, by what Bertrand Russell, et al. referenced as a 'hereditary principle.'" (Lyndon LaRouche, ***The 'Strong Hypothesis' of Biophysics.***) On the contrary, a proof by construction is a means of causing the discovery of an unknown pathway in the mind of someone else and making him discover what should have been known.

A proof by construction is not, in itself, a matter of geometry; but a matter of mind discovering the way to access the truth by time reversal such that it cannot be mistaken for an opinion. As Lyn once put it: ***"Believe nothing that for which you cannot give yourself a constructive proof."*** That, in itself, is a performative constructive proof. How do you do that? No doubt constructive geometry is probably the best tool to accomplish that purpose, especially by following the constructive method of the Monge-Carnot School of the Ecole Polytechnique; but, as that school has always emphasized, such geometrical constructions are merely devices, not some ends in themselves. The purpose of such a proof is to generate in someone else what Carnot had called the ***sentiment of enthusiasm***.



The simplest example of a constructive proof I can show you about this "***sentiment of enthusiasm***" is the method of discovering the unknown. Take the following problem of triply-self-reflective-circular-action: ***"Given a circle, find the missing center."***

Figure 1 Discovering the missing center of a circle.

Take a circle and fold the rim on itself three times to form three chords anywhere on the circumference. Then, fold each chord on itself by intersecting their points on the circumference of the circle, two by two. The last three circular folds (dotted lines) will intersect at the center of the circle. Thus, you have constructed the center of the circle only by a triply-connected circular action. (For further insights, see my report on ***THE PERFORMATIVE TIMELINESS OF PLATO'S PHAEDRUS, PART II***)

Why is this construction valid? Because the proof is not deductive. It demonstrates by construction that the proof of the uniqueness of the circle is generated in your mind by a triple-spherical-circular-action. Since the property of the circle comes from the radial action of the sphere, it must also be the case that constructing the radius of a circle by least circular action will also generate the center of that sphere. The solution to this problem is a variation of the Leibniz method of inversion of tangents whereby, if you know the property of the tangent, you can find the center of curvature of any curve. (See my report on **LEIBNIZ'S PROMETHEAN PRINCIPLE OF CREATIVITY** **)**

In other words, if you know the property of the action, you can anticipate the curvature of what you don't yet know; and, therefore, you are able to apply the

appropriate circular action to what you don't know. Dot it, undo it, and redo it, forward, backward, and sideways, and you will know the complete truth of it, because you will have constructed it, yourself. Therefore, if you can construct it, you know it to be true. Next, apply the same method to the case Lyn presented in his memo to Dr. Webb. He stated the problem as follows:

> "Cusa's "Maximum-Minimum" principle, in that location, is not merely a principle; it is the first modern statement of a universal in physical space-time. It is also, more generally, a solution to the classical Parmenides problem, of rendering intelligible ***the efficient interdependency of microcosm and macrocosm.*** (My emphasis) Starting from this notion of least action, all intelligible forms of constructible existence in visible (discrete manifold) space are generated without additional axioms or postulates, and by methods excluding any employment of deductive methods." (Lyndon LaRouche, ***The "Strong Hypothesis" of Biophysics***.)

Why is "***the efficient interdependency of microcosm and macrocosm***" the universal paradigm of modern science? Because these are the two guide posts which must set the boundary conditions for the directionality of all of scientific progress. However, why is it that only a handful of scientists since Cusa have recognized the necessity of making this principle of least action intelligible?

The only answer I can think of is that the reason is due to the epistemological difficulty of making axiomatic changes from a view of science dominated by sense perception to a view of science dominated by mind; that is, of the necessity of changing from the Aristotelian point of view to the Platonic point of view. In truth, unless the fundamental and incontrovertible difference between Plato and Aristotle is established clearly in one's mind, that is to say, unless ***empiricism of discreteness and linearity*** it thrown out of scientific thinking altogether, science has no chance of making any progress anytime soon. And the reason, as Lyn put it, lies in the constructability of the means of an "***efficient interdependency of microcosm and macrocosm."***

4. THE IRONY OF THE SIX-CORNERED SNOWFLAKE AND THE CREATIVE PROCESS

"The snowflake paper of Kepler is not a treatise on crystallography; it is an investigation into epistemology."

Dehors Debonneheure

Kepler's 1611 New Years Gift of the "Snowflake" is a genial example of the application of the Cusa method of the creative process. The Cusa method properly understood as the Maximum/Minimum least action principle, or the Macrocosm/Microcosm principle of unity between the universe and the human mind, can be restated in the form that Lyn gave to it in this short memorandum on ***"THE STRONG HYPOTHESIS."*** Lyn wrote:

> "Second, Kepler's proof, that the most general laws of ordering of the universe are also governed by the same harmonic ordering otherwise peculiar to the growth and activities of healthy living organisms. It is also the case, that on the atomic and sub-atomic scale, events are organized harmonically according to the same principles manifest in Kepler's system. Thus, at the two extremes of scale, and in the instance of living processes, the picture of the laws of the universe manifest to us in terms of the discrete (visible) manifold, is that of harmonic orderings congruent with the Golden Section. Between the two extremes of scale, any process which is so characterized is either a living process, or a special class of work by a living process. All processes not so characterized are non-living, in the sense that Kepler identifies the distinction in his paper on the snowflake. Thus, a strong hypothesis for the mathematics of living processes, must locate the harmonic ordering characteristic of living processes within the atomic scale of physical phase-space. It appears, at first inspection of the evidence, that the ordering of living processes is "teleologically" ordered, such that whatever healthy living processes do, the result is congruent harmonically with the Golden Section. Therefore, it is the first rule for elementary statements

> respecting living processes, that we must situate those statements within the geometric ordering congruent with the Golden Section, an ordering whose root is the Golden Section harmonics embedded within the phase-space of processes on the atomic scale."

This Kepler approach to the creative process by way of the Golden Section is not a search for forms, or for mathematical formulas in nature, as most investigators who have studied this Kepler paper have been misled to believe. The approach to the creative process is a search for ***a least action pathway which causes something in the universe to change axiomatically.***

Therefore, geometrically speaking, what Kepler is looking to discover is the principle that generates six-sidedness in the solid domain; that is, something impossible except within living processes. Six-sidedness, therefore, is an expression of close packing in the plane; that is, a close packing which, up until Kepler, could not have any existence in the higher domain of the solid. This demonstrates the limitation of geometry. However, very early on, Kepler noted that, regardless of geometrical limitations, if six-sidedness was to be reflected into the higher domain of the solid, it had to be transformed and acquire a different kind of existence.

Without getting upset, Kepler later discovered that, where human beings had failed, honey bees had been able to construct such a higher geometry with their liquid gold. Following the forethought of these insightful bees, Kepler endeavored to construct the beehive keel of cells from which he was able to discover a new principle and construct a new family of regular solids. Kepler called them rhombic solids: the Rhombic Dodecahedron and the Rhombic Tricontahedron. (***Six Cornered Snowflake - By Johannes Kepler***) (See **Figure 4**)

The problem that such a discovery posed was significant for the universe as a whole, because it raised an apparent impossible question: "How does the discovery of rhombic solids help us understand the principle of the unity of the Macrocosm/Microcosm?" The fallacy, here, is to fall into the trap of looking for a mathematical or a deductive answer to such question; and that is why Lyn warned

against the fallacy of looking for ***discreteness and linearity.*** In other words, don't look in the points, lines, surfaces, or solid areas.

As reported by Lancelot Law Whyte in his ***KEPLER'S UNSOLVED PROBLEM AND THE FALCULTAS FORMATRIX***, when Johann Hessel (1796-1872) and Albert Louis Bravais (1849-?) calculated that natural crystals possessed an n-fold symmetry of 2, 3, 4, and 6, with respect to rotational action in the plane, they only gave an apparent solution.

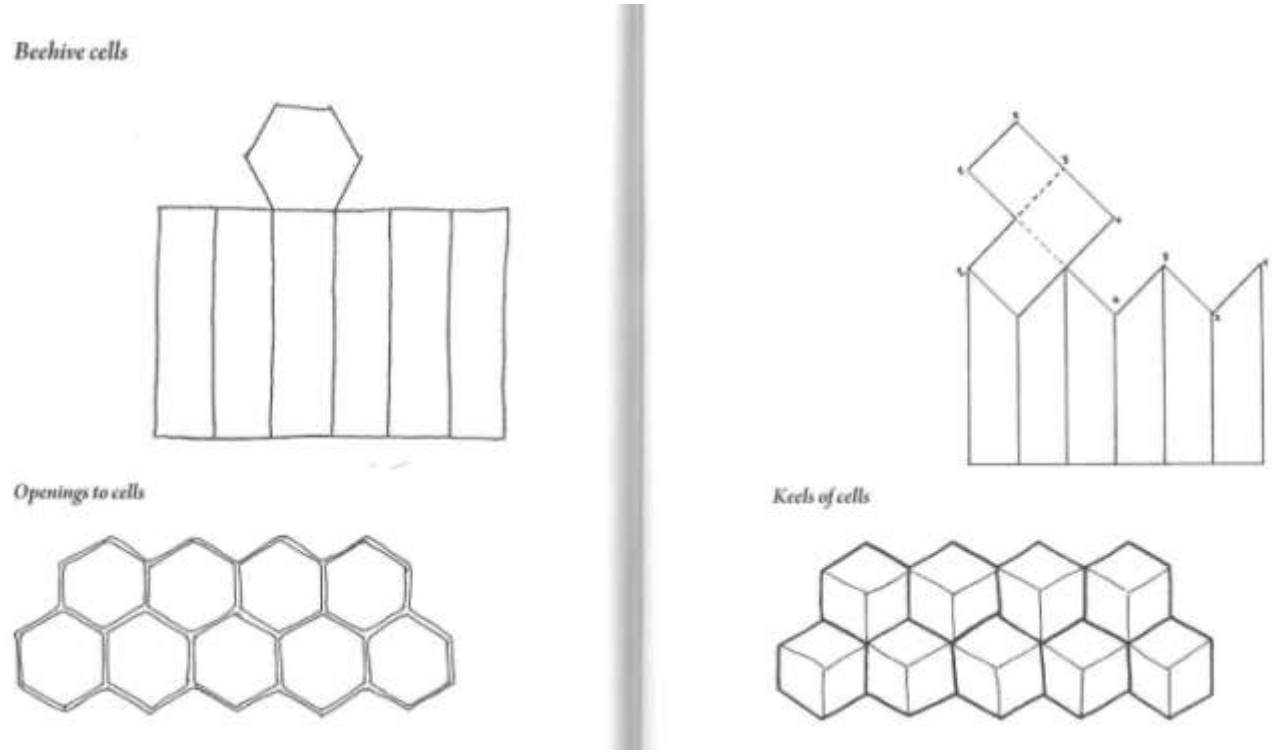


Figure 2 Beehive cells, top and bottom, as viewed in the plane.

The problem is that these investigators had only examined the ***discreetness and linearity*** of their results, without looking into the least action process between microcosm and macrocosm. Even a century later, during the 1950's, when it was discovered that the hexagonal snowflake could be explained by a special arrangement of oxygen and hydrogen atoms, under specific ranges of temperature and pressure, etc., the Kepler question had still not been addressed properly and

still remained unanswered. Even the instability of hydrogen, does not address the Kepler question, which is: ***"How does anything come into being?"***

What Kepler was looking for was an ordering principle of creative change, a principle of transformation that could not meet the requirements of the visual domain, and especially not if such requirements were based ***discreetness and linearity***. The question in the small really begs the same question in the large. So, why not ask it, and investigate it? How does the golden section go from six-sidedness to rhombic-sidedness?

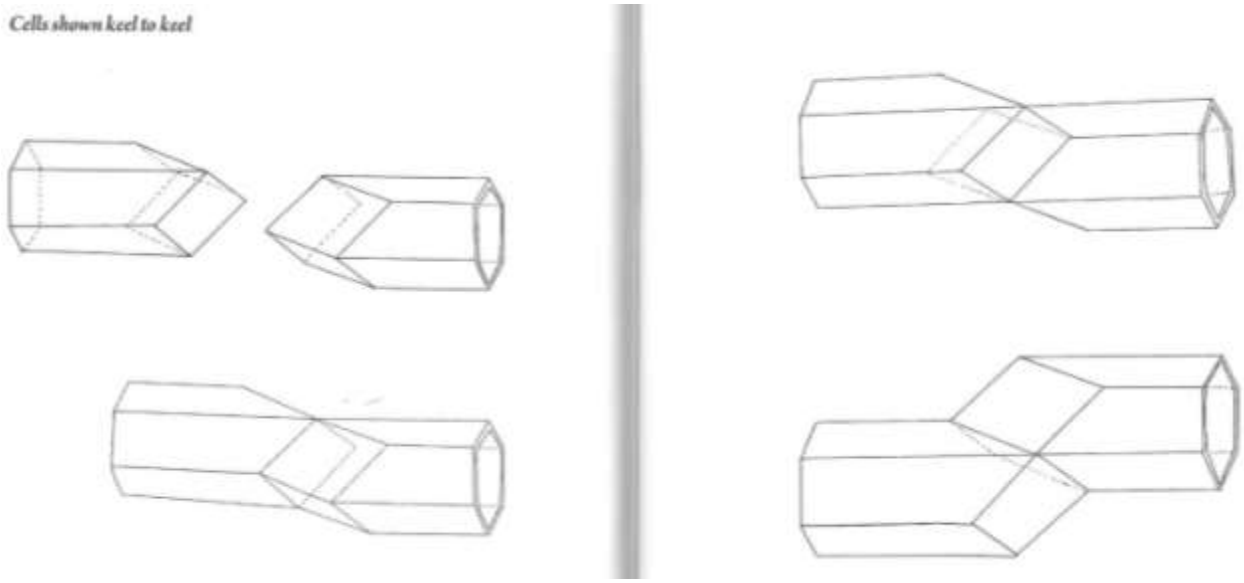
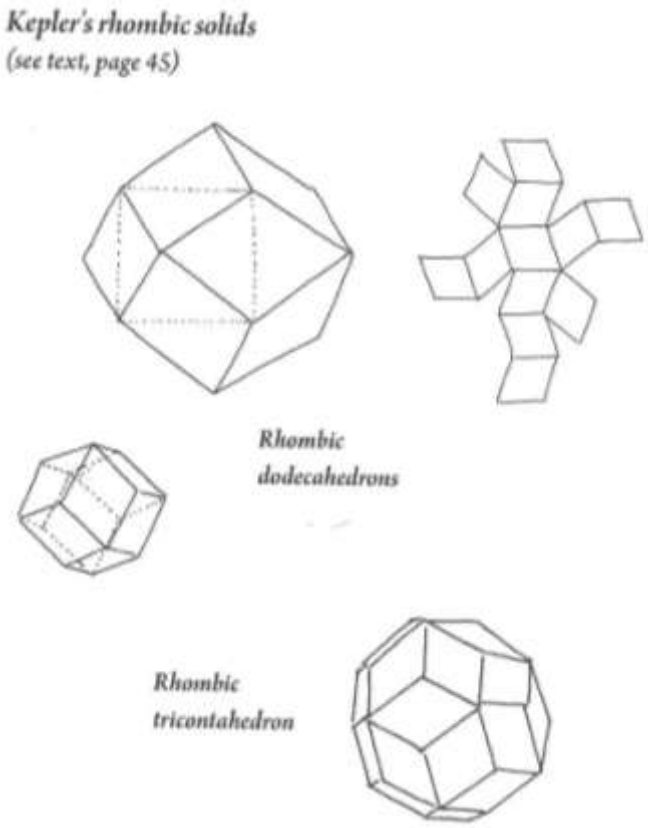


Figure 3 Hexagonal shapes being transformed into the solid state beehive: a higher form of the Golden Section. (Johannes Kepler, ***The Six-Cornered Snowflake, A New Year's Gift,*** First Paul Dry Books edition, 2010.)

Indeed, there is no smooth road from the two dimensional to the three dimensional domain; the pathway is filled with a density of discontinuities. So, why not look at those discontinuities in order to generate the required relationship between macrocosm and microcosm? The process is very similar to that of the spherical construction of the Five Platonic Solids.

This is the Lydian manner by means of which Kepler was able to use the function of density of singularities in order to go from a lower manifold to a higher manifold. As He wrote: "Thus, a space can be completely filled just with rhombic figures of this kind, as long as four three-sided angles or six five-sided [sic] angles always come together at a single point, so that a solid whole is made." (Johannes Kepler, ***The Six-Cornered Snowflake, A New Year's Gift,*** First Paul Dry Books edition, 2010, p. 45.)



Look at the four three-sided angles of the Kepler Rhombic dodecahedron as four geometrical minor thirds generating a dissonance leading to a new domain of regular solids and you will understand how the golden section of the plane domain gets resolved into the higher dimensionality of the rhombic dodecahedron. When the three-sided angle is projected back onto the plane, it is transformed back into the hexagon. The Kepler discovery is the geometrical equivalent of the Bach dissonant well-tempered Lydian modality for the change of keys in Classical music.

Figure 4 Kepler's Rhombic Dodecahedron (3x4 = 12 rhombi) and Rhombic Tricontahedron (6x5 = 30 rhombi).

Are you getting a sense of ***enthusiasm,*** with this discovery? If not, then, it is probably because you have not yet grasped the true discovery that Kepler made

with the transformation of the snowflake. So, you have to ask yourself: "What is the true discovery that Kepler made?" And, if you think it is simply the two new rhombic solids, you are mistaken.

The discovery lies in what Lyn called the density of singularities of passing from the spherical to the polyhedral, and from the polyhedral to the plane; that is, from a higher manifold to a lower manifold. As Lyn put it: "The derived function, of enumerability of a rate of increase of such density of discontinuities, is the form of expression of the strong-hypothetical characteristics of the Gauss-Riemann domain which bears most directly and pervasively upon a proper choice of mathematical physics for living processes." (Lyndon LaRouche, ***The 'Strong Hypothesis 'of Biophysics***.)

So, if this is the key to the "***Strong Hypothesis***," let's use the least action of the triply-connected spherical action to generate the Platonic Solids as a model of the axiomatic limit to the visible domain of sense perception and investigate why such a three-dimensional geometry of vision can be so clear to our eyes and yet be so random and so unpredictable to our minds. This is the dimensionality that was missing in what I have earlier reported on **HOW TO DELIGHT YOUR MIND WITH KEPLER'S SNOWFLAKE**.

Figure 5 The ten circle-sphere generating the rhombic vertices and edges of the dodecahedron from spherical hexagons.

Here, what you want to look for is a discovery which corresponds to a higher level of mental power than that of the bees. The Kepler discovery of the two rhombic polyhedra is merely the shadow of the mental power of the bees whose natural instinct is to construct such rhombic space in order to support the life of their species. From a higher standpoint, however, Kepler's discovery must be for the purpose of supporting not just life, but the immortality of his species.

What Kepler had discovered must also be applicable to the universe as a whole, from the microcosm to the macrocosm. It must apply to all non-living and all living creatures in accordance with a universal principle which grants to each being, the fullest capacity to grow within its own boundary conditions; but in a manner such that the extension of their existence does not exceed the perimeter that bounds them. This is what Nicholas of Cusa had identified as the Minimum-Maximum principle, or the Isoperimetric Principle. This is how man becomes the keeper of the Universe.

CONCLUSION

In conclusion, the question of the axiomatic change from plane geometry to solid geometry (from the hexagon to the rhombi), or from polyhedral geometry to spherical geometry, poses the problem of comparing the minimum and the maximum areas of figures relative to their perimeters in terms of both volume area and surface area. This is the Isoperimetric Principle the bees had been living by, as Pappus of Alexandria recognized, as early as the fourth century AD. However, in the Preface to Book V of his ***Collection*** (c. 340 AD), Pappus added a dimensionality that only the human mind could grasp:

> "Bees, then know just this fact which is of service to themselves, that the hexagon is greater than the square and the triangle and will hold more honey for the same expenditure of material used in constructing the different figures. We, however, claiming as we do a greater share in wisdom than bees, will investigate a problem of still wider extent, namely that, of all

> equilateral and equiangular plane figures having an equal perimeter, that which has the greater number of angles is always greater, and the greatest plane figure of all those which have a perimeter equal to that of the polygons is the circle." (Quoted by Sir Thomas Heath, ***A History of Greek Mathematics,*** Dover Publications, Vol. II, New York, 1981, p. 390.)

Although Pappus did not address the isoperimetric principle as a universal physical principle in the manner that Cusa and Kepler later did, he nevertheless realized the crucial economic aspect of labor power that bees know in their "expenditure of material used in the constructing the different figures."

Similarly, once one discovers that the circle is the greatest isoperimetric plane figure, one is just a step away from discovering that such a minimum-maximum principle of circular action represents the most elementary form of labor least action principle in the economy of the small and of the large. That is the all-inclusive LaRouche economic policy principle that Xi Jinping has just adopted for the world at the G'20 meeting on September 4 and 5, 2016, in Hangzhou, China.

Thus, ***least action generates a maximum amount of work from a minimum amount of labor*** all around the world, but only through the creative process of the human mind. That is the reason why bee cells, like all living cells, have optimal volume for the minimal surface area; and that's the reason why Lyndon LaRouche has been right during all of these years in fostering the creative process which flows from the same pathway. Thanks Lyn and Happy Birthday!

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