
THE LEGACY OF LYNDON LAROUCHE WITH AMPÈRE AND FRESNEL

(How to unravel stubborn underlying assumptions in science and in artistic
composition)

For Lyndon LaRouche's Memorial

Pierre Beaudry, 6/8/2019

FOREWORD

“The process of individual discovery, and refinement of one's own knowledge of universal principles, takes the form of a dialogue within one's self. It is the experience of that self-critical process of change, the which is generated by such internal dialogues, which should lead one to a more refined sense of one's inner self. Such a dialogue on some specific paradox may be recurring over days, weeks, or longer. On one occasion, it is with others. On another occasion, it is with oneself. Nonetheless, on every occasion, it is always, primarily, with oneself.

“It is one's insight into the process of change, associated with the outcome of repeated efforts to perfect such dialogues, through which one's private self-image is elevated. One may be transformed by such habits, away from the self-conceptions of a fixed thing, into a conception of oneself as a process of changing, a continuing process of becoming a better person. So, in Plato's *The Republic*, the leading figure, Socrates, argues for truthfulness and justice. It is in such experiences, and their outcome, that a truthful conception of the nature of both man and the universe is molded.”

Lyndon LaRouche, [*Prometheus and Europe*](#), EIR, July 23, 1999.

INTRODUCTION: ON THE LEGACY OF LYNDON LAROCHE

My task, here, is to assure the legacy of Lyndon LaRouche's ideas not merely by spreading his writings around the world, but more essentially, by assimilating his method of discovery in my own personal way and by replicating it for others as best I can. The question I am posing to myself, therefore, is: how can I use Lyndon LaRouche's ideas as a beacon of light for orienting someone else's mind in the direction of a discovery of principle which is applicable to both science and artistic composition?

The process of any discovery of principle requires a triply-connected transformation which includes: a competent artist or scientist, a skeptical participating observer, and a well chosen subject for an experiment acting as an anomaly representing *something that should not be there*. For the process to succeed, it must include an opposition between two minds and an anomaly capable of eliminating that opposition.

I know very few artistic compositions and even fewer scientific experiments which have been composed explicitly for the purpose of demonstrating the unity of principle between science and art. In the domain of plastic art, I know of at least two compositions by Leonardo da Vinci: *The Virgin of the Rocks* and *The Last Supper*, and two by Raphael Sanzio: *The School of Athens* and *The Transfiguration*. In the domain of science, I know of a few scientific experiments from the Ecole Polytechnique of Monge and Carnot, especially from Jean-Marie Ampère and Augustin Fresnel. Jacques Cheminade's exposé on this subject in 1999 should be a source of inspiration for anyone who wishes to pursue these profound and difficult studies.¹

During the last two hundred years, however, such artistic compositions and scientific experiments have all but disappeared from European and American culture, especially since Hegel's crony, the reactionary Karl Friedrich Savigny, established a false separation between art (*Geisteswissenschaft*) and science

¹ Jacques Cheminade, [The Ampère -Fresnel revolution: 'on behalf of the future'](#), EIR, August 27, 1999.

² Lyndon LaRouche, [The Substance of Morality](#), EIR, May 28, 1998.

(*Naturwissenschaft*). Savigny's assertion that the two domains were fundamentally different was based on the ludicrous reason that art could not be rooted in reason and that science could only be based on deductive logic, leaving out emotions and all passionate commitment to the truth. As a result, art has become totally irrational and science has become a mathematical fantasy.

Lyn identified this problem in his 1998 report on [*The Substance of Morality*](#), and showed that the reason for this was based on the lack of discovery of principles; that is, primarily, the lack of increase in energy-flux-density in human mental activity. Of the three fundamental principles that he had discovered in the late 1940's, he emphasized the second one as being the key one to be discussed in the cited report because it is the most anti-entropic principle for the human mind. I recommend that everyone read that report in its entirety because it gives a unique view of the ontological character of the principle of creative mentation. LaRouche wrote:

“The second of the three principles, whose discovery also dates from the 1948-1951 interval, was the apprehension of the fact, that those same processes of creative mentation, by means of which experimentally validated, original (i.e., "revolutionary") discoveries of physical principle are generated, in response to deductively insoluble paradoxes of experimental physics, are processes identical in their nature to the validatable solution for the type of paradox rightly identified as *metaphor*, as such metaphors are unique to *strictly Classical* modes of musical, poetic, dramatic, and plastic composition in art. This second principle, which is contrary to the currently popular, erroneous notion of a division of art (e.g., *Geisteswissenschaft*) from physical science (e.g., *Naturwissenschaft*), is the key point of reference for the present report.”²

The point to be focused on, here, is to show how to modify the thinking process which must take place for the great majority of mankind on the stage of history. As Friedrich Schiller said, the participant must leave the theatrical representation in a better state of mind than he was before the event took place. In

² Lyndon LaRouche, [*The Substance of Morality*](#), EIR, May 28, 1998.

both cases of science and art, it is the improvement of the human mind which is the moral purpose of the event; that is to say, *agape* or love of mankind, which is capable of causing a transformation which increases the energy flux-density of the individual human mind for the benefit of mankind as a whole. Such is the legacy of Lyndon LaRouche.

ON THE SUBJECT OF LIGHT AND SHADOW: THE TRANSVERSE NATURE OF LIGHT

“Science is not simply the result of observing physical phenomena; it is the understanding of anomalies underlying such phenomena.”

Dehors Debonneheure

When light and electromagnetic waves are conceived as rotating motions in the same way that whole numbers are considered as rotating intervals of action, the idea of particles and of things in and of themselves disappears all together from the domain of science and your mind becomes liberated from the shackles of linearity. French physicist Augustin Fresnel made a perplexing comment about this phenomenon:

“It follows from the principle of coexistence of tiny motions, that the vibrations produced by many shocks in an arbitrary point of an elastic fluid are the resultant of all the agitations communicated at the same moment to this point from the various centers of vibration, no matter how many they are, no matter what the nature and original moment of those various disturbances.”³

What does that mean? The difficulty, here, is that our minds are perplexed because, what Fresnel said, requires that the propagation of light actually show how the mind works in a non-linear fashion. How does light do that? Let's hear what Leonardo had to say about the same subject of non-linear interactions of light and shadow images in the art of painting:

³ Quoted from, [How Fresnel and Ampère launched a scientific revolution](#), EIR, August 27, 1999, p. 37.

"Every body is surrounded by a limiting surface.

Every surface is full of infinite points.

Every point makes a ray.

The ray is made up of infinite separating lines.

In each point of any line, there intersect lines proceeding from the points on the surface of bodies, and they form pyramids. At the apex of each pyramid there intersect lines proceeding from the whole, and from the parts of the bodies, so that from this apex one can see the whole and the parts.

The air that is between bodies is full of the intersections formed by the radiating images of these bodies.

The images of the figures and their colors are transferred from one to the other by a pyramid.

Each body fills the surrounding air with its infinite images by means of these rays.

The image of each point is in the whole and in each part of the line caused by this point.

Each point of the one object is, by analogy, capable of uniting the whole base of the other.

Each body becomes the base of innumerable and infinite pyramids. One and the same base serves as the cause of innumerable and infinite pyramids turned in various directions, and of various degrees of length.

The point of each pyramid has in itself the whole image of its base.

The centerline of each pyramid is full of an infinite number of points of other pyramids.

One pyramid passes through the other without confusion..."⁴

The deeper issue, here, is to reconcile the mind with the apparent opposition that numerous thinkers of the past have created between matter and mind, materialism and spiritualism, art and science, etc., especially for the purpose of recovering the *unity of opposites* between the domains of light and of cognition. This is the fundamental principle that unites Ampère and Fresnel to Leonardo da Vinci in the discovery of transverse waves. This is the revolutionary principle that is still waiting to be discovered today, and must become one of the foundations for future discoveries.

⁴ *The Notebooks of Leonardo Da Vinci*, Oxford University Press, 1952., p. 127. See my report: [LEONARDO DA VINCI, THE VIRGIN OF THE ROCKS.](#)

Christian Huygens originally discovered that light passing through an Iceland crystal takes a special characteristic known as polarization and Gottfried Leibniz had recommended to him that he employ the Leonardo method of understanding the matter of light and shadow in the following manner: "*The whole question lies in the manner with which you have yourself (Huygens) considered that each point of a ray is itself radiating, and how you have composed a general wave for all of these auxiliary waves.*"⁵



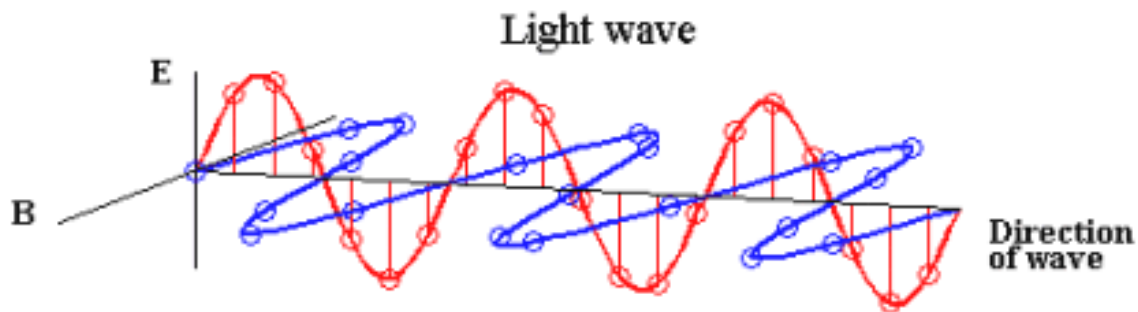
Iceland Crystal

The curious thing about this Iceland crystal phenomenon is that it depends on the angle of orientation of the crystal in space. In other words, the birefringent anomaly disappears when one places a similar crystal on top of the first, along the same axis but at an angle of 90 degrees to the first. What is the significance of that angle? Another interesting feature of this phenomenon, and which may not appear to be associated with it, is the discovery of the triply-connected gimbals of a

⁵ Leibniz letter to Huygens, June 12-22, 1694. This issue also bears on the question of the speed of light and the simultaneity of eternity. The way that space-time is conceived today in science is a fallacy of composition. Only simultaneity of eternity exists for the creative process of mankind, because *agape* is its substance. The question is: how can this be proven with a physical experiment that takes into account the idea of an axiomatic change by time reversal?

gyroscope as discovered by another Monge brigade leader, French physicist, Léon Foucault. Fresnel wrote the following note about this polarizing anomaly:

“I have tried without success to produce fringes using the two images of a luminous point in front of which I placed a doubly-refracting crystal. ...I am beginning to suspect that it could be possible that the two systems of waves, produced by light in the crystals possessing double refraction, do not have any influence upon each other. I have searched in vain for an explanation. For this it would be necessary to know what this singular modification of light really is, which constitutes its polarization.”⁶



Electromagnetic transverse waves: red waves are electrical and blue waves are magnetic.

André-Marie Ampère had already suggested to Fresnel the hypothesis that the action propagated by a light wave is not longitudinal but transverse or perpendicular to its direction of flow; that is, causing change at a right angle. Therefore, the principle of polarization depends on the amount of spiraling action applied to the meridian axis of the action of the transverse plane. In other words, light propagation is a direct expression of triply-connected right angle circular action, and the nature of its propagation changes with the change in orientation of that complex circular action.

Although it was known to exist for centuries, this phenomenon of polarization was never investigated before, because it was never considered to have any epistemological significance. But, then, a revolutionary momentum

⁶ Op. Cit., p. 38.

began to emerge with Gaspard Monge and his brigades at the Ecole Polytechnique when Arago, Fresnel, Foucault, and Ampère put their minds together to investigate and solve a series of anomalies that the nature of light had posed for years. It was Ampère who best expressed the idea of the axiomatic moment of transformation, when he wrote the following profound and substantial statement which was almost a forecast of what LaRouche was to discover more than two hundred years later:

“The experiments of Fresnel have proved that light is produced by the vibrations of a fluid and that these vibrations are transversal, that is, perpendicular to the direction of the light rays; and that, besides this, calculation shows that this sort of vibration would be impossible in a continuous fluid, where the vibrations would become longitudinal while transverse forces might occur if the fluid were composed of atoms held at a distance from each other by repulsive forces...

“[But,] is matter made up of atoms that only occupy a portion of fixed, infinite space, where they are separated by absolutely empty intervals and in which they move by successively occupying different parts of this space?

“We must admit an immaterial, motive substance everywhere where there is spontaneous motion. We then discover that it is in this substance that *thought* is to be found, since words obey it. . . . The cause of all causes, the creative and all-powerful substance is, on the contrary, only known to us indirectly, through its works.”⁷

⁷ Quoted from Jonathan Tennenbaum, [How Fresnel and Ampere launched a scientific revolution](#), EIR, August 27, 1999, p. 39. The original sources have not been given by the author of the article.



Augustin Fresnel (1788-1827)



André-Marie Ampère (1775-1836)

It is important to understand that, in those days, Ampère was still in agreement with Newton on the corpuscular nature of light. But, what is that “motive substance” that he was referring to? Jacques Cheminade’s 1999 presentation of the same subject gave the required clue. He reported that this “motive substance” came from the point of view of Leibniz and noted that it referenced the “*vis viva*” (living force) that Leibniz had identified as the fundamental principle of nature. Cheminade wrote: “In other words, only the Leibnizian concepts can ultimately account for the discovery of a fundamental principle of nature, like Fresnel’s transverse waves.” Then Cheminade referred back to Ampère’s most exquisite moment where he abandoned the Newtonian conception he had previously adopted regarding the linear particle theory of light:

“Pleasure and pain are sufficient to lead the faculties of beasts to their destination. Stronger faculties demand from us other motivations. . . . That strong, involuntary attention which excites within us the pleasure of perceiving new relations between our ideas. . . . The emotions aroused in the soul of those who conceive them before having executed them, by the

representation, at an ulterior moment, of the masterpieces they meditate upon.”⁸

Ampère's fundamental discovery was confirmed by a decision that his friend, Pierre Maine de Biran made when he wrote about this matter as being the center of the Leibniz doctrine of *vis viva* (living force). De Biran wrote:

“It is by always tending to take this sublime point of view that Leibniz often grasps, with extraordinary success, the most unexpected relations between the world of ideas and the world of facts in nature: It is by attempting to find out, through calculus, the means that lead the most directly to the end, that best economized matter, space, and time, that he succeeds in solving questions considered inaccessible for the human mind, or in proving truths previously conceived of but never proven. This is the source of the absolute confidence that always characterized this grand master. . . .

“From the standpoint of the immortal author of the *Monadology*, the science of principles is the same as that of forces; yet the science of forces includes everything that is or can be understood by the human mind, starting from oneself, a force directly given in the primitive act of conscience, up to the absolute force, such as it is, in itself, in the eyes of God; such as it can be in God Himself. The standpoint of the *self* is not the same as the standpoint of God, even though it leads there through an exact analysis and through the same principle of force that completely eluded Descartes and that Leibniz was the first to grasp in full depth. Like Descartes, it is true that Leibniz did not distinguish between these two standpoints or express the link between them, but Descartes had broken this link, whereas Leibniz provided the only means capable of reestablishing it. It is thus to his doctrine that subsequent progress of the true philosophy of the human mind will be connected.”⁹

⁸ Jacques Cheminade, [The Ampère -Fresnel revolution: 'on behalf of the future'](#), EIR, August 27, 1999, p. 50.

⁹ Jacques Cheminade, Op. Cit., p. 50. Cf. Maine de Biran, *Biographie Universelle de Michaud*. Pierre Maine de Biran is the initiator of the method of deep epistemological introspection.

The unity of light and thought, the *coincidence of opposites* between mind and matter unified into a coherent understanding of how the mind and the physical universe are connected through the *vis viva* (living force) of triply-connected circular action acting as the common principle of change between those three dimensionalities. That is the legacy that Lyndon LaRouche took from Leibniz and transformed for us into a compass of orientation for future generations.

**PIERRE MAINE DE BIRAN: ON THE DISCOVERY OF THE SELF AND
ON THE ORIGIN OF THE PARADOX OF THE UNITY OF OPPOSITES**

*“Don’t stand between yourself and mankind; build the bridge
to the future with the coincidence of opposites.”*

Dehors Debonneheure

As Platonists and Leibnizians, André-Marie Ampère (1775-1836) and Pierre Maine de Biran (1766-1824) both had amazing insights into the investigation of the *self* in relationship with the idea of causality or of force. The investigation started in 1805 and lasted eleven years until 1816. The search began in earnest when de Biran attempted to solve the conflict of opposition he recognized between Leibniz and Descartes on the subject of *living force* (*vis viva*) of human action, and this is what prompted him to study in depth what he termed the “consciousness” (apperception) of one’s *self* in contrast with the “*cogito*” fallacy of Descartes.¹⁰

De Biran’s initial question about the human mind was as follows: “Is there such a thing as an immediate recognition of the *internal self*?” His answer was affirmative and that *self* is what says “I” as soon as it can differentiate itself from everything else. However, this internal awareness or “recognition” of the *self* is not the thinking process that Descartes had imagined, nor is it simply a sensation of being of a little me; it is the identification of a *fluid realization of being alive* in a continuous and durable mode of internal existence which is separated from and opposed to everything else that exists externally. However, this identity of the *self* is not an absolute certainty; it is an imperfect estimate, a rough guess, a mere

¹⁰ The source of de Biran’s research is Leibniz’s *Monadology*.

glimpse of being something different than the rest of the world and which also belongs to the rest of mankind.

From that simple recognition, one can realize that the original condition of the *self-conscious* human being is, from the start, in a *conflict of opposition* with the external world, but not with mankind. This condition generally implies an ontological conflict between an *internal* and an *external* world. So, very early on during the development of the human subject, it appears that the disposition of the individual *self* finds itself confronted with the outside world and seeks confirmations of this from other human beings, because very early on, the *self* seeks to discover that other human beings are also likely to be in the same condition.

No matter when it happens, certainly at some very young age, the *self* finds itself jumping into life in a conflicted manner and in a fighting state for the development of its mind. From the vantage point of epistemology, therefore, this early recognition of the *self* should be considered as the ontological moment of emergence of Cusa's *coincidence of opposites* as the means of solving all future problems.

The point that de Biran further emphasized, and which is the most important one, is that “at the first moment of its existence, the *self* recognizes itself immediately: it doesn't think, it doesn't understand, and it doesn't feel its being; but as soon as time begins for him, or when it feels that its being is connected to an ordering of succession, it recognizes and understands itself as an identical being, as a permanent and durable being, since only beings are able to endure.”¹¹ This realization is the original physical space-time frame of *self-consciousness*. That recognition of a “durable being” in physical space-time is the original condition that Lyndon LaRouche, in the footsteps of Nicholas of Cusa, had identified as the state of being *in the physical simultaneity of eternity*.

Such awareness implies that the human *self* is beginning to understand that human *self-consciousness* does not belong to the chronological succession of

¹¹ [*Œuvres Philosophiques de Maine de Biran*](#), publiées par V. Cousin, Tome Troisième, Librairie de Ladrange, Paris, 1841, p. 13. Translated by P. B.

clock-time, but to a different form of time which must be directly and uniquely connected with space. Here, de Biran asserts: “Thus, the *self* recognizes itself primarily, and it understands itself to exist simultaneously as a real existing being in time, in opposition to everything that is called things or objects, and that it can only be thought of or perceived as being in space; which is the mode of coordination of existing beings, modality, and attributions or qualities of such beings.”¹²

From there, de Biran adds that it is only natural that the next question should be: “What if a thought, which is the conception and the expression of a thinking being, meaning a being who thinks about itself, were to be the idea of a substance or that of a force?”¹³

At this point in the process, de Biran has completely internalized and integrated the Leibnizian conception of *vis viva* (living force) as the substance of the relationship between the *self* and the outside world. But, how do you come to the *unity of opposites* between external things and the *self*? De Biran refers to Leibniz who said: “The human soul can only conceive of things outside of itself by means of things which are inside of itself (*externa non cognoscit nisi per ea quae sunt in semetipsa.*)”¹⁴

In other words, the human mind can only know external things by transforming them and modifying them through the active forces of his living will and of his mind. If that is so, then, how can both external things and mind have the same underlying principle? Here, de Biran considered that Francis Bacon was right: “*Ratio essendi et ratio cognoscendi idem sunt*” (The reason for being and the reason for knowing are the same). And similarly, he agrees with Leibniz’s principle of sufficient reason which considers that the internal *living force* of the *self* is such that it is a thinking individual, who is identical with the thinking substance that can transform and be infinitely transformed. As de Biran put it:

¹² Ibidem, p. 13.

¹³ Ibidem, p. 14.

¹⁴ Ibidem, p. 15.

“If Descartes believed he could establish the first true self-evident principle of all science by saying: ‘*I think, therefore I am a thinking substance,*’ – we have a better way to identify [*the self*] and in a more effective manner, with an irrecusably intimate sense by saying: ‘I act, I will, or I think in myself the action, therefore, I know myself to be the cause, and therefore, I really exist as a cause or force [of change].’¹⁵

In so doing, de Biran restored the Platonic essence and function of the *self* that Descartes had misunderstood and misconstrued. However, the danger, here, is to impose abstractions to external reality by spiritualizing material things and materializing spiritual things by turning the interior mental domain into a world of sense perception objects. Since both are fallacies of composition, both should be avoided.

De Biran understood that the mind had the freedom and the power to cause change in a universe which is otherwise governed by necessity, because the *living force* is everywhere manifested inside of the two domains. At this point, the freedom-necessity conflict began to be posed as the central opposition between humanity and nature. The first was considered as a self-conscious *living force*, while the other was considered as a *blind force*. This became viewed as an absolute distinction which differentiates and separates physical sciences from moral and epistemological sciences, the physical world and the domain of the mind.¹⁶ This became the Thucydides Trap of Savigny, the axiomatic difference between Plato and Aristotle. De Biran had a clear understanding that Descartes belonged to the school of Aristotle with his passive substance of physics while Leibniz belonged to the school of Plato with the *living force* of his monadology.

The improvement that Lyndon LaRouche later brought to this distinction is that the substance of the process which makes the human subject reflect on himself is not that of a mirror object, but the force of creative mentation, *agape*. I will return to this point later with the Prometheus question.

¹⁵ Pierre Maine de Biran, [*Œuvres inédites de Maine de Biran*](#), Tome III, publiées par Ernest Naville, Dezobry, E. Magdeleine et Cie, Paris, 1859, p. 409.

¹⁶ *Ibidem*, p. 144.

AMPÈRE'S ELECTROMAGNETIC CONTRIBUTION TO EPISTEMOLOGY

"You should not love others as you love yourself because, when you love yourself, you are not interested in anyone else."

Dehors Debonneheure

André-Marie Ampère and Pierre Maine de Biran were both Platonists and Leibnizians; they both agreed on the primary feature of the human mind as being a *living force* commanding both human knowledge and human action, both of which are coherent with the harmonic proportionality that Leibniz had established between reason and power, as if they were two combined electromagnetic forces: "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."¹⁷ In early 1807, Ampère explained his conception to de Biran as follows:

"Man acts and knows, hence, there are two classes of phenomena which refer to his actions and those which refer to his knowledge, each of which can only develop with the help of the other. In fact, how could one act without knowing and how can one know without being able to react to the impressions one receives?

"It is precisely because these two classes of phenomena mutually depend on each other and can only develop together, that it seems to me impossible to classify them without this first distinction in conformity with the phenomena that nature offers us under those two distinct viewpoints."¹⁸

¹⁷ Gottfried Leibniz, [*On the Establishment of a Society in Germany For the Promotion of the Arts and Sciences*](#), The Schiller Institute.

¹⁸ [*OEUVRES DE MAINE DE BIRAN*](#), par Pierre Tisserand, Tome VI, Librairie Felix Alcan, Paris, 1930, p. 385. There is an ambiguity regarding this 1807 letter because the editor attributes it to Maine de Biran at the beginning while the signature at the end indicates it is from Ampère. Translated by P. B.

Ampère and de Biran both agreed that this Leibnizian principle of proportionality between reason and power is the unique basis for establishing harmony between the ideas and the actions that they were in the process of classifying. However, the interesting part is not that classification, *per se*, but the principle behind the ordering of the ideas, the affections, and the emotions that Ampère proposed, which is the Leibnizian Principle of Happiness. Ampère summarizes his conception as follows:

« Here are the four orders of phenomena which I am considering for the psychological understanding of the human mind: determinations, actions, ideas, and coordinations. I will show them to you later as classified in orders of genus and species, so as not to miss any of them.

« Those orders correspond to the four different divisions of the sciences relating to psychology: morality, which studies our determinations and rectifies those that must be corrected; economics, which teaches us how to orient our actions in the most efficient least action fashion toward the end that we have chosen; ideology, where we scrutinize our ideas and the manner to achieve them; and logic which deals with the means of applying the different coordinations of such ideas in conformity with the truth.

« In order to subdivide these four orders into *genera*, I will identify the determinations as affections whose purposes are to make the human subject happy or unhappy. Therefore, pleasure, pain, rest, joy, desire, the impatience before a desired outcome, anger, admiration, fear, hope, etc., will all be considered as affections, which I will later identify into different species of affections.

« There are two circumstances under which our determinations stop making us happy or unhappy; that is, when they refer to something that does not depend on us or to some reality we are not thinking about. In the first case, the circumstance depends on our willfulness; in the second case, I would call them [natural] inclinations. »¹⁹

¹⁹ Op. Cit., p. 386.

The significance of Ampère's classification is that he organizes his ideas and emotions axiomatically in accordance with a republican principle as opposed to an oligarchical one. On the contrary, British intelligence manipulation of popular masses has been using the same method to an opposing effect for the past few hundred years at the very least. Then, Ampère added an interesting note which may also be applied to such mass psychological manipulations:

« The proof that we also feel attracted or repulsed by the very things that we consider to be impossible, resides in the fact that if we were to change our minds in this respect, we would immediately be overtaken by desires and fears. Therefore, when we form an abstract idea of a bad action or of some heroic action, we feel aversion for the first and attraction for the second, because as soon as we attribute existence to them, we either suffer pain or feel joy. However, this situation never arises when we simply think about those two things in an abstract way. Now, you understand what I mean when I talk about inclinations. »²⁰

THE TRANSVERSE EFFECT OF LIGHT THROUGH SHADOWS

“Thus, we say, commonly, that ‘man uses fire.’ Animals do not do so of their own inspiration. The concept of a general notion of energy-flux-density, designates a fundamental principle which, as such, underlies the characteristic distinctions of the human species.”

Lyndon LaRouche, [*Now Return to the Future.*](#)

This method of thinking is the way that classical artistic composition also deals with in matters of physical-space-time. Here is what Lyn wrote about the sculptures of Scopas and Praxiteles:

“It is most informative, to look at the way in which the same problem addressed by Classical sculpture appears in Classical Greek, as opposed to inferior Latin notions of space-time. The Roman conception, like that of Hobbes, Descartes, and Newton, is of a rectilinear universe of matter (objects) roaming in space and time. The ancient Greek Classical thinkers,

²⁰ Op. Cit., p. 387.

such as Plato, looked at the physical universe as Scopas and Praxiteles defined Classical sculpture. The real universe, including the view by Classical Greek astronomy, was not seen as rectilinear in form, but as a curved universe, just as the angular measurements of the ancient astronomers defined the universe as a whole as a more or less spherical one.

“The function of all Classical art is the same as that. Literal meanings are always false to reality. It is through focussing upon the ambiguities posed by attempting to explain the world in terms of literal statements, that the human mind discovers the real universe hidden behind the deceptive screen of rectilinear-like, literal statements.”²¹

The point that Lyn is making is that, like artistic composition, science does not move forward in straight-lines and cannot be grasped directly through a literal meaning of things; science and art are always ambiguous. However, as Lyn pointed out, it is not reality which is ambiguous, but our mental approach to reality. Our frame of reference is so constructed. And, that is not a defect, but an opportunity that too many people have been missing in their educational process. The beauty is that it is always through artistic and scientific ambiguities that the mind makes discoveries, because that is the way to correct one's errors of linear thinking. That is the way that perfectibility works. As Lyn said: “Classical art corrects the error, to bring the idea corresponding to reality into the mind of the hearer, where the mere literal words could not.”²²

Fresnel was searching for a way to develop a similar theory of light to definitely overthrow the Newtonian doctrine of linear emission of light. His task was to concentrate on the discovery of anomalies that would prove how the linear emission of light as particles was false, but that could only be accomplished by focussing the mind on ambiguities. In other words, it is the ambiguity of anomalies which dictate how the mind should behave with respect to the reality of scientific experiments, because such ambiguities are the stumbling blocks to all of our

²¹ Lyndon LaRouche, [*Prometheus and Europe*](#), The Schiller Institute, 1999.

²² Lyndon LaRouche, Op. Cit.

underlying assumptions. Let us see how this can be represented as a Promethean task in artistic composition.



“Prometheus bound” by Nicholas-Sébastien Adam, 1735-1762. Louvre Museum. The triple transverse effect of light, emotions, and mind in artistic composition.

An efficient representation of that Prometheus task of “correcting the error” has been rendered by the tormented sculpture by Nicholas-Sébastien Adam. Can you identify the paradoxical anomaly of the subject?

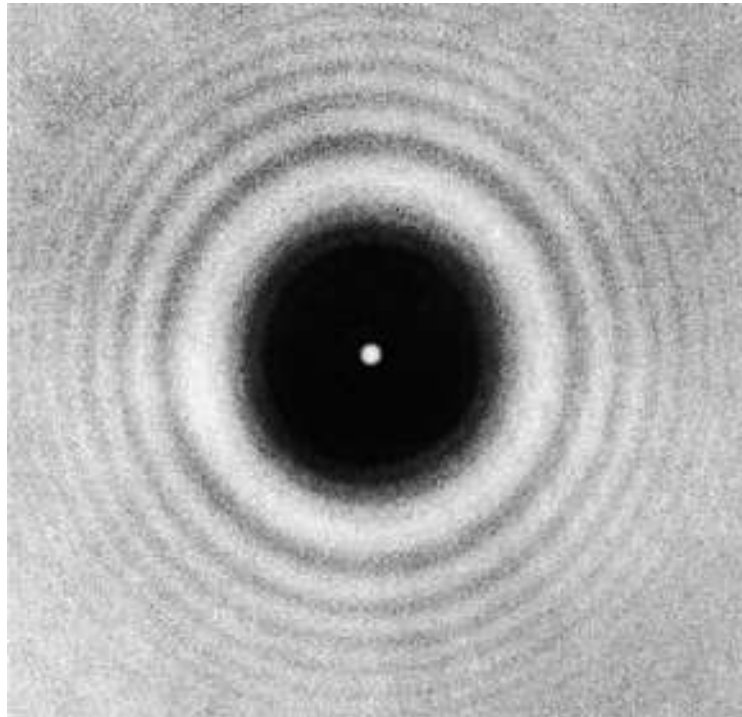
The “Prometheus bound” of Adam is composed from an idea of a triply-connected paradoxical transformation of a sphere. Prometheus is so precariously off balance that his tilted bodily position is almost impossible to understand; you have a subject being torn between two forces acting on it at the same time. Prometheus is pivoting on one leg, in a totally unstable suspension between the extreme pain of the vulture’s grip on the one hand, and the extreme muscular effort of breaking his chains from the rock. This ambiguity represents two opposite and contradictory forms of sufferings: the suffering of the personal human being and the suffering to save mankind. These are the two opposite forces of Gethsemane that Prometheus is being tortured by. The problem to be solved: Is Prometheus going to succeed in extricating himself from the torment inflicted on him by Zeus or is he going to succeed in breaking his chains to save mankind? That’s the tormenting question that Adam posed to the observer. The question is not answered because it is up to the observer to resolve the conundrum.

However, two important clues are given that reveal the intention of the artist, providing the observer is looking to discover *what should not be there*. There is at least six inches of looseness in the chain attached to Prometheus’s right wrist and there is no chain attached to his right leg. What are the underlying assumptions behind those two anomalies and how do they reveal the choice to be made between the two opposite tendencies of “love of oneself” and “love of mankind”?

That is the point that Adam is shedding light on: unless the spectator challenges his own underlying assumptions about his own intentions regarding “love of himself” and “love of mankind,” and unless he puts into question the validity of his own axioms with respect to those two opposite tendencies, he will not be able to conduct a truthful experiment about this work of art. That is the courageous Promethean choice that Fresnel had also made concerning Newton, when he wrote:

“It is hard to conceive how the inflexion of light into the interior of shadows could have escaped notice by such a capable observer as Newton, especially when one remembers that Newton had done experiments with very tiny objects, since he even used strands of hair. One is tempted to believe that his theoretical taboos contributed to a certain extent to close his eyes to these important phenomena, which greatly weaken the main objection upon which he based the superiority of his system.

“According to the emission theory, nothing could be simpler than the phenomenon of shadows cast by objects, above all when the source of light is reduced to a luminous point; and yet, *nothing is so complicated!*”²³



The Fresnel bright spot. <http://www.rakeshkapoor.us/ClassNotes/Diffraction.html>

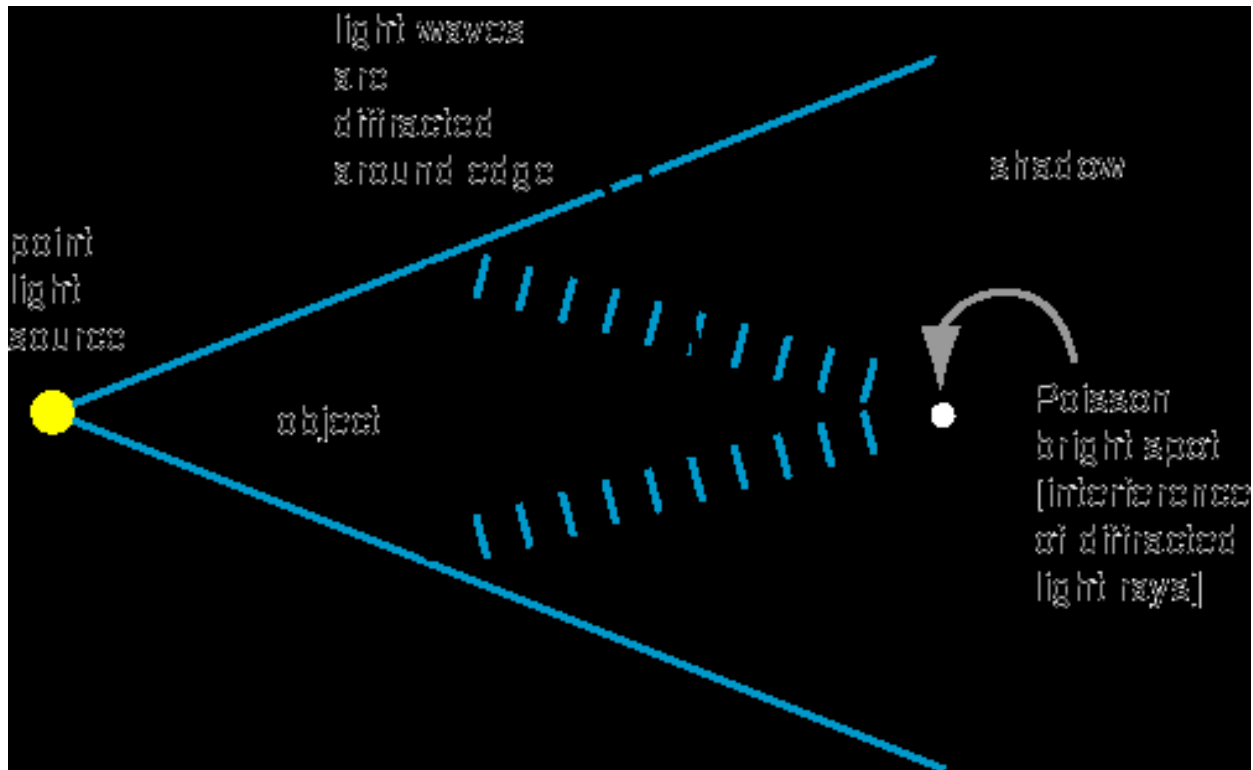
²³ Quoted from Jonathan Tennenbaum, [How Fresnel and Ampere launched a scientific revolution](#), EIR, August 27, 1999, p. 35.

The method that Fresnel chose was a typical Platonic experiment of discovering *what should not be there*; and he chose to conduct his experiment in the most effective way possible for the purpose of shattering the underlying assumptions of the observer's unquestioned axioms. He decided to cast his experiments in the setting of Plato's Cave.

The above image is a replica of the shadow that he projected on the wall of the spectator's mind in order to make him discover the light of reason. The question is: why is there a point of light in the center of the shadow? Is that not completely impossible? The reader should be aware that the following experiment cannot be done without a "point source" of light, like that of a laser, and without a near perfect circular object.

The optics experiment that Fresnel made was devastating for the Newtonians, because it proved in a definite way that the Newtonian theory of light as a stream of particles moving in straight lines was wrong. Before the experiment began, the Newtonian Siméon Denis Poisson, who had read Fresnel's memorandum, objected loudly by stating that if Fresnel's construction were to be validated, it would require the appearance of a bright spot in the middle of the shadow, which is obviously impossible, and thus proving his theory to be wrong. See the following insightful video: [*Light in the Shadows: the Poisson Spot.*](#)

After a silent moment of reflection provoked by Poisson's mistaken remark, François Arago, a judge in the contest, stood up and conducted the experiment of projecting the image of a solid disk shadow in full view of an audience which included Poisson. The shadow was completely black until, suddenly, by adjusting the proper distance of the disk between the light source and the screen of the shadow, the so-called impossible light spot in the center of the shadow appeared on the wall much to the dismay of all of the Newtonians present and to the perplexed excitement of everyone else. By demonstrating the existence of a spot of light in the center of a shadow, Arago proved that Fresnel's propagation of light could only be explained by a wave theory of light. That is how to break the chains of public opinion in Plato's Cave.



The Poisson bright spot. <https://www.sutori.com/item/untitled-0f24-afb2>

The Fresnel experiment was a demonstration of the Huygens principle which says that every point in the plane of an obstacle is a new source of light; therefore all of the points on the circumference of the obstacle will fall in the center of its shadow as if the light waves were following the triple rotating pathway of the penumbra of a cone whose base was the disk and whose apex was centered at that Poisson bright spot.

The beauty of such a demonstration is that Fresnel did not require any mathematical equation to prove it; all he required was the courage of stating the truth of a rigorous experiment in public and engage the observer into making a discovery of principle. By doing so, he hammered in the last nail into the coffin of Newton's theory of light. From that day on, the Fresnel spot also became known as the "Poisson spot," whose underlying assumption about the linearity of light came down through history as being remembered as the biggest mistake he ever made.²⁴

²⁴ This is also a beautiful example of how Mazarin had successfully negotiated the Peace of Westphalia.

WHAT IS AN ELECTROMAGNETIC ACTION?

When, in 1820, the Danish physicist Hans Oersted discovered that an electrical current going through a wire was the cause of making the needle of a magnetic compass rotate perpendicular to that current, he also discovered that the principle of electromagnetism was based on transverse circular action. He described the phenomenon as follows:

“It appears, according to the reported facts that the electrical conflict is not restricted to the conducting wire, but that it has a rather extended sphere of activity around it . . . the nature of the circular action is such that the movements it produces take place in directions precisely contrary to the two extremities of the given diameter. Furthermore it seems that the circular movement . . . should form a mode of action which is exerted in a helix around this wire as an axis.”²⁵

Thus, for the first time in modern physics, the principle of triply-connected circular action, so often promoted by Lyndon LaRouche in constructive geometry, is established as a universal principle of physical space-time. Ampère wrote about this fact with astonishment and identified the public opinion culprit behind the lack of courage that prevented researchers to come up with new observations based on this newly discovered principle. He wrote:

“It is indeed unbelievable that for 20 years [up to Oersted’s work] the action of the voltaic pile on a magnet had not been tested. I think we can assign a reason for it: It lies in the hypothesis of Coulomb on the nature of magnetic action. This hypothesis had been believed as if it were a fact; it absolutely dismissed any idea of an action between electricity and so-called magnetized wires. The prejudice against this had reached the point that, when Arago spoke of these new phenomena at the institute, they were dismissed just like the stones that fell out of the sky. . . . They had all decided that it was impossible.”²⁶

²⁵ Jonathan Tennenbaum, *Op. Cit.*, p. 40. The original sources have not been given by the author.

²⁶ *Op. Cit.*, p. 41.

More recently, Lyndon LaRouche made a similar remark about the reductionist view of Coulomb when he wrote:

“...the work of Ampère-Weber et al. is evidence in support of my insistence on the dubiousness of the assumption, that the arbitrary presumption, that repulsive “Coulomb forces” are extended infinitely, into large and small, is only arbitrary and not very intelligent, ivory-tower speculation, rather than sound physics. This proof, as set forth by Professor Moon, of the absurdity of such taught dogma as the so-called “Coulomb” principle, exposes the folly of the presumption by some, that a “Coulomb barrier” constitutes a principled barrier to any development of controlled thermonuclear fusion power production for society.”²⁷

Here, the false underlying assumption is that action in the universe is expressed in straight lines. Aristotle, Euclid, Thomas Aquinas, Hobbes, Descartes, Kant, Clark and Newton were all linear advocates while Plato, Eratosthenes, Saint Augustine, Nicholas of Cusa, Kepler, and Leibniz, were all advocates of a non-linear universe based on circular curvature of the universal human mind.

Whether our observations are made in the small or in the large, the universe is everywhere non-linear, and straight-line action is a fiction, unless linearity is made to play a crucial role in a *conflict of opposites*, as in the Foucault pendulum or as in the case of the diameter of a circle. Similarly, light and mind are determined by multiply-connected circular action of change. This means that the universe is not representable as the self-evident three-dimensional Cartesian coordinate system with X, Y, and Z linear directions. Real space-time is change, and change is the medium of transformation that the creative human mind must discover to be its domain.

This is where the curvature of classical artistic composition and of well chosen scientific experiments must become the Socratic midwives of all future mental breakthroughs. Lyn was right when he stated: “Literal meanings are always

²⁷ Lyndon LaRouche, [Shrunken Heads In America Today](#), EIR, April 20, 2001, p. 29.

false to reality. It is through focussing upon the ambiguities posed by attempting to explain the world in terms of literal statements, that the human mind discovers the real universe hidden behind the deceptive screen of rectilinear-like, literal statements.²⁸

Those are the only two choices: straight line action or circular action. That's the choice that Hamlet was confronted with: "To be, or not to be..." That is, the conflict between no-change and change; either you remain with the old axioms or you break with them at the risk of having your mind end up swimming in an ocean without a shoreline. That is the hard choice to be made in art as well as in science; that is the price to pay for Promethean creativity. The irony, however, is that if you choose no-change, you are doomed; but if you choose change, you have to learn how to swim in all directions into the unknown. Which way are you going to go? How are you going to find the appropriate compass? Let's have a look at the LaRouche compass.

CONCLUSION: THE LAROUCHE COMPASS (Excerpts from LaRouche on the idea of an axiomatic change in Brahms' 'Four serious songs' as transcribed in the Morning Briefing of May 19, 2019)²⁹

"In any case, it started with me, in dealing with a question of poetry, as Classical poetry. And the relation between Classical poetry, as composition, and proper rendition, and the communication of ideas which correspond by the nature of their discovery, to universal physical principles.

"The question is why does poetry do this, in a way which the educated, school use of the English language does not do, even back then, before it degenerated as much as it's degenerated recently. People do run-ons. They don't speak. They don't think. They recite words in a string. Then, we still had a few people who could actually think, when they spoke poetry, for example some of the best Classical actors.

²⁸ Lyndon LaRouche, [*Prometheus and Europe*](#), The Schiller Institute, 1999. Originally published in EIR, July 23, 1999.

²⁹ LAROUCHE/PAC: [*CLASS #4: ITALY –SCIENCE & CULTURE*](#). May 18, 2019.

“Now, this became clearest, for me, in the course of the period from about 1947 into 1952-53, it became more and more clear to me, that the Classical German Lied, in its use of the human voice, is not merely a way of singing, the bel canto way of singing, and it means that the bel canto [audio loss] -- of course it's perfectly clear in the Italian, the Italian Classical works, such as Verdi. But the German has a very specific characteristic to it, in the way it develops around Classical poetry, the communication of ideas.

“Now, the combination of all of this, in terms of all of the qualities which I located in the Classical German expression of music, was the Brahms *Vier Ernste Gesänge*. And particularly, the very last part of it, the sostenuto part, "*Aber die Liebe...*" that the transition of the best singers, from the "*Drei*" and then the rest, and then the "*aber die Liebe*," when properly articulated, so there's really a continuity; you have a rest, but no rest, because, in a sense, the hearer is hearing the last note of "*Drei*," it is suspending that, and it is coming into a half-tone up, but into a different modularity. It's still in the same key, the known key signature, but it's a different modularity. And it's done in a different voice. And a transition from "*diese Drei*," to the beginning of the "*aber die Liebe*," is actually the introduction of an idea. And when it is phrased in such a way that the continuity bridges the irony, bridges in a sense a kind of dissonance, between the last note of the "*Drei*" and "*aber*," across this rest -- when that occurs, you have a very striking effect on the mind.

“Now, in order to do that, you have to have a bel canto singer, a really Classical, Florentine bel canto singer. I was acquainted with some bel canto singers, but my experience from about 1952 and '53 period, was with this Fischer-Dieskau performance of the *Vier Ernste Gesänge*. It was this particular, last part of the performance, which particularly struck me, this transition across the rest from the "*Drei*" to the "*aber die Liebe*," because this expresses an idea.

“Now, this is the way music has to be approached, that is, anything that is worth music. You don't start from theory, to interpretation, to text.

You start from idea, which has to be ironical, paradoxical, and yet a resolved paradox, an idea. You start from the idea, to how [you] are you able to effect this effect, more efficiently than you can in Classical poetry as such, within music? And how must music be developed to do this?”³⁰

This LaRouche method of identifying a singularity within the anomaly of the process of inversion in music is the key to the science of artistic composition. When a thoughtful singer like the famous alto, Gertrude Pitzinger, sings this last passage of 1 Corinthians 13: “these three; but the greatest of these is love,” a change should take place in your mind whereby it goes into an axiomatic transformation as if through a fusion process. The individual mind fuses with the mind of humanity as a whole; that is, it becomes one with the substance of *vis viva* (living force) that Leibniz had identified as the principle of creativity in the universe as a whole: that is the LaRouche legacy of *agape*.

FIN

³⁰ Lyndon LaRouche, Morning Briefing, May 19, 2019.