WALTER ELSASSER AND AN EPISTEMOLOGICAL VIEW OF THE EARTH'S ELECTROMAGNETIC DYNAMO

A dialogue between Ernie Shapiro and Pierre Beaudry, August 2018 to July 2019

FOREWORD

The present correspondence is an epistemological investigative dialogue between Ernie Shapiro and Pierre Beaudry on the German-born American scientist, Walter M. Elsasser, who is the father of the current Dynamo Theory of the Earth's electromagnetic field.

This correspondence, which was mostly developed during the year 2018, represents a series of provocative hypothesis about the science of biology and the geometrical principle that underlies it.

Ernie and I have decided to make this exchange of ideas public because it might provoke some interest among other researchers who are also involved in the investigation of discoveries of principle.

INTRODUCTION

When Biologist Walter M. Elsasser (1904-1991) discovered the boundary conditions of an axiomatic change in his study of living organisms, he adopted a basic assumption whereby causality could not be found inside of their atomic or chemical combinations. He then stated this following fundamental assumption: "*The basic assumption to be made in our interpretation of holism is that an organism is a source (or sometimes a sink) of causal chains which cannot be*

traced beyond a terminal point because they are lost in the unfathomable complexity of the organism."[1]

This means that for any given domain of knowledge, there is a boundary condition which tells the researcher that when his method leads him to a bad infinite, he has reached an insurmountable limit and he must, therefore, discover a higher transfinite geometry. Such was the epistemological limit that Elsasser had reached in 1987, when his book, *Reflections on a Theory of Organism*, was published. That is also the limit that Lyn had identified for the domain of molecular biology when he concluded, in the same year, that biologists must surmount the axiomatic limitations of linearity and discreteness. Lyn wrote:

> "In physics today, we are cruelly burdened by the popular assumption that 'physically elementary' is signified by that which is primitively countable arithmetically, and the presumed elementarity of linearity. Hence the notions of physical laws are stated in terms of scalar (discrete) magnitudes, together with linear notions of space and time. This is a cruel burden, since all truly elementary statements are non-linear propositions in the Gauss-Riemann complex domain.
>
> "It is this mistaken approach to representation of fundamental and other physical laws, the which prevents such a mathematical physics (or, biophysics) from rendering intelligible such elementary notions as 'creation' and 'life'. It is this which causes the actuality of "creation" and "life" to fall between the cracks of statements in acceptable forms of deductive logic, and of a mathematical physics defined formally in terms of a deductive logic. The axiomatic assumption of discreteness and linearity is the vicious root of these formal difficulties; without eradicating these complementary, axiomatic assumptions of all deductive systems, a valid astrophysics, microphysics, and biophysics is impossible, in each and all cases.
>
> "The solution is most simply represented by the statement, that discreteness and linearity are brought into existence within the discrete

[1] Walter Elsasser, *REFLECTIONS ON A THEORY OF ORGANISMS*, John Hopkins University Press, Baltimore, 1987, p. 37.

manifold by that multiply-connected form of continuous least action which is axiomatically neither discrete nor linear. Hence, the mere existence of discreteness or linearity is a product of "creation" so defined: the generation of true singularities by an adequately defined notion of continuous function. On no less a basis than this correction, can either "creation" or "life" be rendered intelligible. […]

"We may say, for purposes of broad description, that "life," as distinct from presently accepted notions of molecular biology, is characteristically electromagnetic in these indicated terms of non-linear reference. Hence, crucial experiments in this domain must show that we can strengthen or destroy life with non linear electromagnetic pulses, without actions defined in terms of presently accepted notions of molecular biology."[2]

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WALTER ELSASSER'S THEORY OF THE EARTH DYNAMO, 8/30/2018

Hi Ernie,

I hope you are well and are continuing your axiom busting work.

I am currently studying Walter Elsasser on the Earth Dynamo and his conception of living organisms. I find that he is very close to Vernadsky and possibly Lyn's view against mechanistic science. Can you tell me what you think of his work?

All the best to you,

Pierre

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[2] **LYNDON LAROUCHE, THE 'STRONG HYPOTHESIS' OF BIOPHYSICS, 1987**.

From: ernest schapiro [mailto:ernestschapiro@gmail.com]
Sent: Saturday, September 01, 2018 2:47 PM
To: pierrebeaudry@larouchepub.com
Subject: Fwd: WALTER ELSASSER'S THEORY OF THE EARTH DYNAMO

Hi Pierre

I'm feeling pretty well. Very happy you are reading Elsasser. I learned of his work through Dr. James P Isaacs's book "Complementarity in Biology, Quantization of Molecular Motion", which is a book I consult all the time and have esteemed for more than 45 years. Isaacs doesn't have Riemann in mind but he uniquely points to anomalies. I wish I could get another member to read it! I read some of Elsasser's The Physical Foundations of Biology a couple of years ago so I am now rereading it. I'll send you my thoughts probably in a few days. Is there anything by him you would like me to read?

Best wishes,

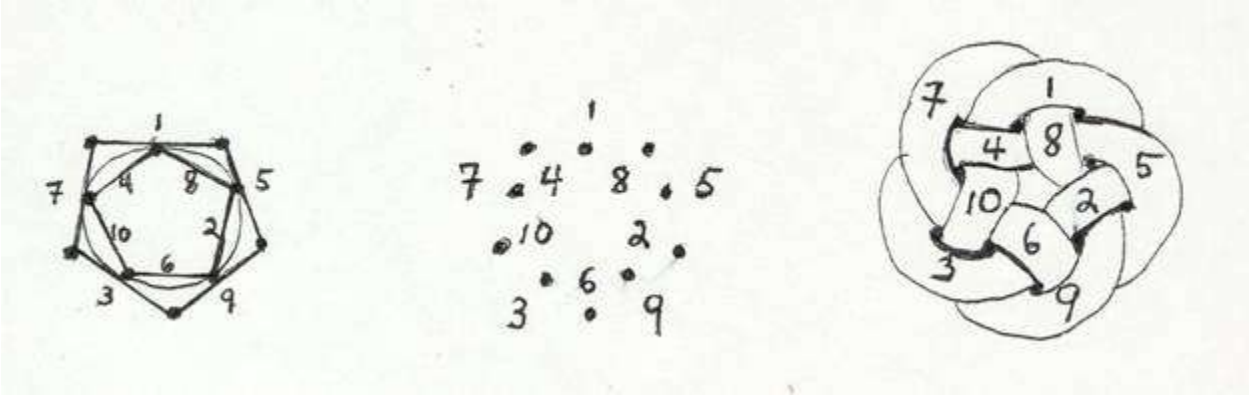
Ernie

Hi Ernie, 9/2/2018

Thanks for responding so quickly. What I am looking for with Elsasser is the epistemological significance of his Torus Principle.

I have been attracted to Elsasser because it was he who had coined the terms *poloidal* and *toroidal* for the development of the Earth's magnetic field. I got curious to see if he was also thinking in a doubly-connected circular action manner, because that is for me the key to thinking epistemologically in a Galactic manner as Lyn had been advocating we turn our minds to. The Torus has been for me the best way of determining how to go from the lower geometry of simple circular action to the higher domain of doubly-connected circular action (like a

rotating planet orbiting around the Sun). Remember my little construction of 1996 in my video: **Time Reversal Lecture Pierre Beaudry 1996**



The non-linear passing from the simply-connected manifold to the doubly-connected manifold.

What happens when you go beyond the quadrature of the circle and you rotate in and out of a flat domain of two opposite pentagons separated by a circle? You have to transform your mental process from the simple circular action of the circle to the doubly-connected circular action of the Torus. As a result, you discover the Gauss-Poinsot higher geometrical domain underlying primitive roots and the congruence of residues. You discover that the geometry underlying whole numbers is doubly-connected! Is the electromagnetic domain doubly-connected in a similar manner? That's what I am looking to find in Elsasser.

For the last 20 years (since about 1996) I have been investigating the Torus geometry as an epistemological/geometrical model for both understanding the electromagnetic system of plasmas and the creation of new ideas by means of *coincidence of opposites*. When I discovered that it was Elsasser who had coined the terms *poloidal* and *toroidal* and that he was considering the electrical field as toroidal and the magnetic field as poloidal, I got real excited and began to realize that the Homopolar principle behind the galaxy and the nebula, for example, might also be doubly-connected and might indeed be working like the principle of creating new ideas by way of the *coincidence of opposites*. I have not found any evidence yet that Elsasser was consciously working from that vantage point.

What I know of Elsasser so far is through the biography of his friend, Harry Rubin, ***WALTER M. ELSASSER*****.** In that book, Rubin identifies four principles of organisms which I find of a great interest, because they seem to be congruent with Lyn's opposition to logico-mathematical schemes. They may also be congruent with Vernadsky, but I don't know. Here is what Rubin said about the four Elsasser principles:

> "1. **The first principle is ordered heterogeneity.** Combinatorial analysis shows that the number of structural arrangements of atoms in a cell is immense; that is, much greater than 10^{100}, a number that is itself much larger than the number of elementary particles in the universe (10^{80}). But biology shows us there is regularity in the large where there is heterogeneity in the small, hence order above heterogeneity. This concept of ordered heterogeneity was first introduced by the molecular biologist Rollin Hotchkiss, systematized by the embryologist Paul Weiss, but given quantitative definition and set in a general theory by Walter.
>
> "2. **The second principle is creative selection.** A choice is made in nature among the immense number of possible patterns inferred in the first principle. The availability of such a choice is considered the basic and irreplaceable criterion of holistic or non-mechanistic biology. The term "creative" refers to phenomena that, like everything in biology, are compatible with the laws of physics but are not uniquely determined by them. No mechanism can be specified by whose operation those selected differ from those not selected. He points out that the number of different patterns is also immense in the physical science of statistical mechanics, but in that case the variation of structure from pattern to pattern averages out. The patterns of inorganic systems repeat themselves over and over again ad infinitum, while those of each organism are unique. The selection of a relatively small number of organisms from the immense number of possibilities allowed by quantum mechanics is a primary expression of biological order and is the scientific counterpart of the term "creativity" used in ordinary language.

"3. **The third principle is holistic memory.** It provides the criterion for choice not expressed in the second principle. That criterion is information stability. The term "memory" in a generalized sense indicates stability of information in time or, as in the case of heredity, the reproduction of information in an empirical sense, that is, without our knowing the full mechanism of reproduction. The creative selection of the second principle means the organism has many more states to choose from than are actually needed. The third principle says the organism uses this freedom to create a pattern that resembles earlier patterns. Walter borrowed the term "memory without storage" from the philosopher Henri Bergson, who was considering the memory function of the brain in his book *Matter and Memory*. Walter considered holistic memory an epistemological innovation that was the touchstone of his theoretical scheme but realized that it might seem like black magic to many of his readers. However, he noted that the concept is free from internal contradiction while it obviously runs counter to habitual thought. In that formal sense it is no different from the concept of the antipodes, which would have been inconceivable before Newton since the people in Australia should have fallen off the earth. Memory without storage is considered as transmission of morphological features through time without a material memory device, just as relativity is based on the transmission of signals through space without a material carrier.

"4. Holistic memory requires a **fourth principle, operative symbolism**, to indicate that a material carrier of information is needed, namely DNA, but this acts as a releaser or operative symbol for the capacity of the whole organism to reconstruct a complete message that characterizes the adult of the next generation. Walter was sketchy and superficial about the fourth principle and considered it in the nature of a specific detail. In other words, operative symbolism is not necessary to the development of the postulational system of the first three principles that can do away with the conceptual difficulties and internal contradictions that always appear in any purely mechanistic interpretation of organic life. The informational system

of organisms is therefore postulated to be dualistic; on one level it is mechanistic in the operation of the genetic code; on the other level it is holistic, involving the entire cell or organism." (Harry Rubin, *WALTER M. ELSASSER*, National Academy Press, Washington D.C., 1995, p. 156-158.)

I have ordered from the library Elsasser's *Reflections on a Theory of Organisms*. It will take a few weeks before I get it and I can make an evaluation after that. I would appreciate very much if you could have a look at this book also and let me know what you think from this vantage point of epistemology.

Thanks a lot for the help and all the best to you.

Pierre

From: ernest schapiro [mailto:ernestschapiro@gmail.com]
Sent: Wednesday, September 12, 2018 6:39 PM
To: pierrebeaudry@larouchepub.com
Subject: WALTER ELSASSER'S THEORY OF THE EARTH DYNAMO

Hi Pierre:

I'm reading his book *Reflections on a Theory of Organisms*. It's much better than his 1969 book the Physical Foundations of Biology. I think it has a valuable approach. Hopefully it can complement the LaRouchian approach exemplified by Ben Deniston's class of April 1, 2017. (See link.) Ben is the first since Vernadsky to identify the space time in living matter and I feel that is a remarkable advance; at last Riemannian physics is applied to biology, something Lyn sought to do but lacked the material that under Lyn's guidance Ben put together. In my view the coherence in the large that Ben has identified needs to be identified in the small, by the *coincidence of opposites*. Perhaps what Fritz Albert Popp has identified as the coherence of biophotons at the cellular level is a case in point.

https://larouchepac.com/new-york-class-series Scroll down to April 1st class.

I will also forward you an article showing what I consider remarkable harmonics expressing the effect of biological space time.

Ernie

From: ernest schapiro [mailto:ernestschapiro@gmail.com]
Sent: Wednesday, September 12, 2018 7:02 PM
To: pierrebeaudry@larouchepub.com
Subject: HARMONICS OF BIOLOGICAL PHYSICAL SPACE TIME

https://www.researchgate.net/profile/Stan_Lindstedt/publication/247545782_Body_Size_Physiological_Time_and_Longevity_of_Homeothermic_Animals/links/5547ab190cf2b0cf7ace90e6/Body-Size-Physiological-Time-and-Longevity-of-Homeothermic-Animals.pdf

See the log-log plot of cycle length versus body mass. This should mean something to you given your longstanding interest in proportionality and you may help me to put it in a new a different light!

HARMONICS OF BIOLOGICAL PHYSICAL-SPACE-TIME

Thank you Ernie, 9/13/2018

Yes, the *coincidence of opposite* is the crucial point. I fear that without the identification, transformation, and resolution of some biological form of this paradox, we are not going to get anywhere. That is precisely what I am looking for in Elsasser's use of *toroidal* and *poloidal* least action.

I am expecting to get *Reflections on a Theory of Organism* from the library today. I will send you my impressions as soon as possible. Meanwhile, can you

tell me what you know about the Elsasser theory of Dynamo and the creation of the Earth's Magnetic Field?

Pierre

Dear Ernie, 9/13/2018

Thank you for this fine article. I find the proportionality measurements for vertebrates fascinating, because it is implicitly coherent with some complex form of multiply-connected circular action which Lyn made me discover years ago. However, it is the epistemological/geometrical characteristics of such a multiply-connected circular action which I would like to identify more precisely in biology and that is the reason why I went back to Elsasser. My hypothesis is that non-living processes belong to a simply connected manifold, living processes belong to a doubly-connected manifold (galactic), and thinking processes belong to a triply-connected manifold (Trinity). My question to you is: How does Elsasser's use of *toroidal* and *poloidal* least action applied to living processes? How can two opposite forms of circular action of rotation and of orbitation express change in biology? Is the blood stream cycle a good way to look at this? When I think of cycles, or cyclical change, I think of Torus geometry.

I am asking the same question about the Lindstedt's article you sent me. What is the axiomatic nature of the action behind Lindstedt's quadratic choice of the fourth root of body mass, M1/4 ? Is there in biology a quadratic or biquadratic value which may be related to the quadratic and biquadratic congruence idea of Gauss, for example? I know there exists such an epistemological value in artistic composition, most emphatically in musical composition with the quadratic Lydian intervals of action of J. S. Bach, for example. Musical transformation can readily be expressed by poloidal and toroidal action. See my old report **AN ELECTRODYNAMIC MUSICAL TORUS** . That, for me, locates musical composition as a fundamental characteristic of living processes with clear reaches into the epistemological domain.

The fact that there are 3.9 heart beats per respiratory cycle seems to confirm that living processes also make Lydian quadratic choices, because, regardless of size, they reflect that cycle times for complex living organisms are proportional to the periodicity of the smallest forms of life, provided they are viewed from the standpoint of Lyn's idea of *dimensionless constants*.[3] The relationship between body size and the ratio of blood circulation time to heart contraction time is also fascinating, because it also seems to be quadratic. Is the reason for Lindstedt's periodical proportionality related to a process which is doubly-connected (*toroidal* and *poloidal*)? Is Lindstedt's equation for population growth (p. 5) coherent with Vernadsky's view of a triply-connected universe?

My point in all of this, is that, thanks to Lyn, the human mind is not limited to a doubly-connected manifold, but such a manifold has become for me an adequate means of establishing the *coincidence of opposites* and it is because of that fact that man is different from the animal and is able to live in the triply-connected domain of increasing energy flux-density, but only through first discovering the domain of *coincidence of opposites*.

Thanks for this input,

Pierre

THE SELF-GENERATING DYNAMO OF THE EARTH'S MAGNETIC FIELD

Hi Ernie, 9/15/2018

I found what I was looking for with Elsasser, and it is completely revolutionary. I am only amazed that I had never discovered this before. I replicate below what I found in his book ***REFLECTIONS ON A THEORY OF***

[3] See **LYNDON LAROUCHE, THE 'STRONG HYPOTHESIS' OF BIOPHYSICS, 1987**.

ORGANISM. So far, his most significant contribution to epistemology and to biology is his axiom busting Chapter 7. *Computer Models. Memory*.

HOW THE SELF-GENERATING DYNAMO OF THE EARTH'S MAGNETIC FIELD WORKS LIKE A MEMORIMAGINATION PATHWAY (draft not to be circulated)

One of the most important needs to protect human memory from failing is the elimination of noise, as it is conceived by "Shannon's Law" for the protection against information degradation in a computer. However, in matters of axiomatic transformation, the notion of noise in computers is made to work in an inverse manner compared with human memory in axiomatic matters. In fact the solution to noise in the human mind works opposite to what J. Von Newman had identified as "majority organ," or what I would call a "popular opinion function."

Von Newman considered that majority opinion was a way to eliminate errors in computers, but he never saw that it was the inverse with the human mind.

Take the example that Elsasser described as an application of the so-called "Second Law of Thermodynamics applied to information; that is, the "Shannon Law." Elsasser says: "*The need for protecting the information by a computer from degradation by noise constitutes a major task of the engineer*." (Idem, p. 77) He described how to solve the repetition of an error in a computer:

> "If I send one and the same message over a wire twice, then if an error occurs, it is likely to effect only one message since the error is a rare event, unlikely to be repeated. But I have no way of knowing which one of the two messages has been affected by error; in order to find this out, I must send the message three times; then if two messages agree and the third disagrees, probability considerations tell us that the third is most likely the one which is in error."[1]

This is a variation on the three minds problem as I have developed in my Peace of Westphalia papers. According to Elsasser, this "clumsy" reductionist

[1] Walter M. Elsasser, *Reflections on a theory of organisms*, The John Hopkins University Press, Baltimore, 1987, p. 78.

process does not apply to living processes, because there are no counterparts in the domain of non-living, and the time factor must be taken into account. His most interesting application of the failure of cybernetics to living processes is applied to "brain states."

Elsasser first looks at the brain as being similar to a cybernetic system, and he realizes that the processes of *speed*, *reversibility*, and *immensity of patterns* are quite similar; however, this is where the similarity ends, because something happens which takes quite a "spectacular form" : "*It indicates that no two brain states are ever alike, either for the brain of the same individual at different times, or for the brains of two different individuals*."[2]

And the reason this is the case is because of the nature of a very specific aspect of the brain, which is that it has a living memory. Elsasser makes the point that a living memory is axiomatically different from a so-called computer "memory," because it has *autonomous* (freedom) properties. For that reason, when speaking of a machine, Elsasser makes the appropriate point of using the term "storage" instead of "memory," because the brain is not a robot. In other words, "memory is based essentially on a process of heterogeneous reproduction and not on the (replicative) action of storage devices, and this will require a great deal of discussion by experts before it can be generally accepted."[3]

Elsasser correctly considers computers as "stupid;" that is, "A computer, and its 'memory' (= storage device) can only put out what previously has been put into it." (p. 86) Therefore, a computer is stupid precisely because it lacks imagination. If a machine cannot make associations between thoughts or images, it cannot be creative. As Elsasser put it: "A computer is quite unable to produce any kind of association in the psychological sense of that term; it could never say 'this reminds me of…'"

Most people are very impressed by the fact that a human being is capable of memorizing huge portions of a Shakespeare's plays by heart, and by fallacy of comparison, so is a computer; however, this is not what matters here. The point to

[2] Walter Elsasser, Op. Cit., p. 82.
[3] Walter Elsasser, Op. Cit., p. 86.

be remembered here is on the "relationship" between memory and imagination, the pathway of transformation which I would call the "memorimagination."

Let's take this case as an example. What happened in your mind (not your brain), just now, when you read the word: "memorimagination?" Follow the pathway of your immediate memory as you investigate the coming together of those two words. A new connection has been made between two human functions, a connection that did not exist before. This connecting phenomenon has always existed, because this is how the creative mind works, but the term that I chose for it is new. Memorimagination is the performative epistemological concept which relates to all forms of axiomatic transformations between memory and the imagination as the analysis situs of what Elsasser called "memory without storage." This is how the coincidence of opposites works; this is how the electric field and the magnetic fields also work as one electromagnetic system.

This is the amazing conclusion of Elsasser, which is the same as expressed by Henri Bergson in his 1896 book, *Matter and Memory*; that is, where memory should no longer be understood as a storage area. Memory is the universal analysis situs of innumerable exchange and transformations of ideas, across human history, somewhat like a living-historically-connected telephone exchange system. I can only be thrilled that Elsasser felt compelled to add to his revolutionary epistemological discovery, the following historical axiomatic change and make a call to some of his closest historical friends:

> "There is one notable thing about Bergson's idea: so far as it could be considered a scientific hypothesis it was purely negative, and so inadequate. It needed therefore to be built up into a genuine theory which embodies the concept of *memory without storage. I suggest therefore that the idea, ultimately going back to Bergson, of a memory lacking the mechanistic side of storage, be made the focal point of a holistic thinking.*
>
> "But the obstacles that stand in the way of an acceptance and elaboration of this idea are not in the nature of technical complications in abstract thinking; they lie very largely in the mental attitude of biologists; Biology has in the past always managed to get by with the existing,

> essentially Newtonian models of space, time, and causality (except for the replacement of Newtonian concepts by quantum-mechanical ones, which is a matter of the underlying physics and chemistry). ***Here for the first time in history the biologist has to face squarely his own epistemological problems*** (emphasis in original): They are condensed in the phrase, 'memory without storage.' The advantage of the physicist, which consists in having a long tradition in attacking and ultimately solving epistemological problems, cannot be gainsaid. This tradition begins with Copernicus and Galilei (who demolished Aristotelian physics) and ends with Plank and Bohr (who succeeded in transforming Newtonian physics into quantum theory). Now it is the biologist's turn. ***The time has come to face and digest the concept of 'memory without storage.***'"[4]

Yours,

Pierre

THE SELF-GENERATING DYNAMO OF THE EARTH'S MAGNETIC FIELD

From: Ernest Schapiro [mailto:ernestschapiro@gmail.com]
Sent: Thursday, September 27, 2018 7:10 PM
To: pierrebeaudry@larouchepub.com
Subject: Elsasser

Hi Pierre:

I am very happy with your discovery of the implications of Elsasser's work. I learned of him through James Isaacs's book Complementarity in Biology, but I had overlooked what was unique about Elsasser., even after reading some of his 1969 book. . Isaacs's thesis is that certain biological processes are indeterminate from a mechanistic stand point and therefore necessarily quantized. He spells out a lot of

[4] Walter Elsasser, Op. Cit., p. 89

unsuspected implications of this quantization, including coherent biophotons, before there were electronic devices to detect biophotons..But Isaacs did not address the fundamental issue of freedom raised by Elsasser, although he has pointed to some of the implications of Elsasser's work. However what I got from Elsasser's last book is something else, the necessarily creative power of life which expresses freedom. Isaacs ignored that. This is very compatible with Leibniz's ideas about the spontaneity of the monad, which he particularly develops in New System of Nature and of the Communication of Substances, as Well as of the Union of Soul and Body, 1695. I was very struck by Elsasser's assertion that memory has the same significance as the orderly physical reproduction of an organism; neither can be accounted for by discrete elements like genes or memory "engrams." I read Bergson's *Matter and Memory* perhaps a year ago and recognized his insistence that memory is non material. Bergson had an important influence on Sheldrake's ideas of immaterial causation.

Underlying these unique capabilities of living processes is coherence, or perhaps what Leibniz saw as preestablished harmony. The parallel log-log graphs by Calder and Linstedt indicate that, by having all these different cyclic processes pegged to the mass in the same exponential relationship, they are thereby in coherence with one another. What in the very small would be the counterpart of this relationship? I am thinking of the coherence properties of biophotons.

I like your ideas about double connectivity. The body plan of nearly all animals is toroidal. This is developed by Stuart Pivar in the *Origin of Form*. Robert McMenamin has also written an online book on it called Paleotorus that Ben Deniston brought to my attention. Why do you say that toroidal action implies the coincidence of opposites? Also what universal physical principle underlies the role and importance of the torus and double connectivity? How are double or multiple connectivity necessary for the organism's intention? Might it be a representation of two interacting principles? How do you relate electricity and magnetism to double connectivity?

I think of the organism as driven by interacting principles or dynamisms including metabolism, homeostasis or preservation of the internal milieu,

reproduction, the healing of injuries through tissue regeneration, neutralization of stress, and the urge to evolve to a higher form of life. Might these in aggregate constitute a Riemannian manifold? These different dynamism interact very strongly so that you find one hormone can have effects on several domains, and many hormones appear to have the same effect.(Isaacs stresses that what first provoked him into his researches were experimental observations of hormonal effects such as those on cardiovascular action.) The question might be: how do they come to interact creatively? What I just described might be also an instance of multiple valuedness, an aspect of Riemann surfaces i.e. the particular hormone would have a different significance, depending on the context it is acting in.

What seems to be missing in Elsasser is any notion of energy flux density. The virtue of Ben's work is what flows from his discovery that by multiplying 1. the scaling relationships of the cycle duration in time to the mass by 2. The scaling relationship of metabolism to mass, you get energy flux density per unit of mass otherwise known as action, the integral of energy times time. which is relativistically invariant!. This, as Ben points out, coheres with Vernadsky's biogenic migration of atoms and Lyn's energy flux density in economy, thus giving us potentially a "strong hypothesis" characterizing three different antientropic domains. Lyn's discussion of "relativistic economics", see EIR Volume 36, number 36, develops this strong hypothesis. Perhaps it was the fascination with "information" as opposed to energy, or worse yet, the popular idea that information is in a sense interchangeable with energy that distracted Elsasser.

I think it is very striking that economies and organisms are relativistic throughout their duration, whereas in the nonliving domain, relativistic effects appear to come into play at the extremes. However, perhaps on closer examination we might find that in fact atoms are based on relativistic effects such as Weber suggested. . Also, some time ago I studied intensively Edward M. Purcell's Berkeley Physics course Volume 2, Electricity and Magnetism. He argues in detail in his undergraduate textbook that the magnetic effect of a moving charge is relativistic. For some reason, I associate relativistic effects with phase changes and formation of singularities. I have a particular question: the log log plots by Linstedt and Calder portray changes in the EVOLUTIONARY phase space. But what is the

implication for the phase space of the INDIVIDUAL organism? I think perhaps what is implied is that homeostasis requires a particular curvature of the phase space for the particular species, and that departure from that curvature is harmful. To support that idea one would need to show that physiological adjustments maintain the appropriate curvature of space time in living matter, and I don't see yet how that is to be determined.

I believe that Elsasser's idea that an organism has freedom expressed in creativity requires us to go back and look at ALL the phenomenology of life with that discovery of his in mind. His idea of freedom has a subtle implication: the organism freely selects the path that ensures conservation of its traits, except in the case of evolution where they undergo a harmonically organized change. It occurs to me that that there is redundancy in biological chemistry and perhaps in physiology as well, and that the redundancy enables the organism to realize the intended result in different ways. Isaacs discusses redundancy as ensuring that the vast increase in possible "states" precludes a mechanistic basis, but his focus is on the resulting quantization, rather than freedom per se. Instead, Elsasser stressed the importance of redundancies for preventing errors in computer systems. His books require very careful reading. I am going back to his earlier book to see how his thinking evolved and perhaps thereby discern his higher hypothesis that guided him. Also its important to consider his predecessors. Riemann in his Philosophical Fragments wrote about how the mind of the earth selects evolutionary processes in species of plants, but he didn't think of the species itself as having freedom, so far as I know. It might be useful to look at Fechner, who may have had such an idea and wrote a whole book on the souls of plants. Fechner helped Weber develop his model of how charges in relative motion interact leading to his famous force law which gave the atomic radius as the singularity at which the force of interaction reversed direction. Riemann greatly admired Fechner, including his Zenda Avesta.

A few months ago I spent a lot of time grappling with Lev Beloussev's book The Dynamic Architecture of a Developing Organism. I was very intrigued with his idea about how living tissue actively responds to being stressed or relaxed, and that this unexplained phenomenon is essential for the sequential process of self organization that constitutes embryonic development. In terms of what Elsasser is

saying, the remarkable ability of an embryo to end up with the appropriate innate form despite all kinds of things you might do to it in terms of removing, switching, or adding parts to it points to the organism's ability to make choices. This seems to constitute redundancy i.e. it can arrive at the final state by different paths. He also describes his illustrious grandfather, Alexander Gurwitsch's ability to determine from the curvature of an embryonic layer what that layer will look like a bit later. He called that the principle of the biological field, the dynamic preformed *morpha*.

This is a short article by Beloussev et al from 2006: Morphomechanics: Goals, Basic Experiments, and Models. He is unusual for his strong interest in metaphysics. https://www.ncbi.nlm.nih.gov/pubmed/16479477

I think there are other members who would be intrigued by Elsasser and that we could get a discussion process going which is sorely needed, especially since there is not a functioning basement team..

I am watching your video. The sound quality could be better, but I find it challenging. I am hoping it will cast light on Elsasser.

Best wishes, Ernie

THE SELF-GENERATING DYNAMO OF THE EARTH'S MAGNETIC FIELD

Hi Ernie, 9/29/2018

I love your account of the free spontaneity of the monad. I never thought of it that way before. I need to think about this some more.

Yes, I think this is right: "that memory has the same significance as the orderly physical reproduction of an organism." But does it also use similar space-time pathways? I am also wondering if this does not also apply universally to plasma organization and if all three non-living, living, and cognitive domains compose with similar *orderly processes*. I have also asked my good friend, Tony Peratt about this, but he has not yet answered me. As far as Bergson is concerned, I

never found him very useful for our work, because he missed the anti-entropic question completely. However, Elsasser did not miss that fundamental question, because everything that he writes implies he has bone the anti-reductionist domain.

Even though you have given me a lot to think about, I will only be able to answer your questions for now: "Why do you say that toroidal action implies the coincidence of opposites? Also what universal physical principle underlies the role and importance of the torus and double connectivity? How is double or multiple connectivity necessary for the organism's intention? Might it be a representation of two interacting principles? How do you relate electricity and magnetism to double connectivity?"

I say the Torus implies the *coincidence of opposite* because it is generated by two opposite forms of circular action exhibiting both positive and negative curvatures at the same time. The doughnut hole in the middle of the Torus exemplifies that double curvature. However, this is produced only as the result of a higher form of circular action which is triply-connected, i.e. spherical. I see the Torus action as an incomplete spherical action where the diameter of one action is smaller than the other. Spiral actions are also doubly-connected forms of circular action. Triply-connected spherical action also implies *coincidence of opposites*, which generates everything in the physical universe. Even though I may never be able to express this except in some metaphorical form like the spherical form of Platonic solids, I am also of the belief that our mental powers for generating new ideas is bounded by ***an infinitely diversifiable geometrical/epistemological form of triply-connected spherical action***. This, to me, is the single principle that I keep operating from in everything I do. That is what corresponds for me to the idea of the Holy Trinity. Unfortunately, too many of our members, young and old do not understand this idea of the *Filioque*, and have, therefore, no idea what I am talking about.

The most effective way that I have found to apply this Hylozoic Monism principle is within the ***historical dynamic of the Peace of Westphalia***. It was Lyn who convinced me that this principle was located in history most importantly. And, he was right. Leibniz convinced me that I couldn't find it in geometry, and Cusa

convinced me that I could not discover it without the *coincidence of opposites*. This is the reason why I don't believe in "a representation of two interacting principles," because that is precisely the Aristotelian form of Hylemorphism that has been avoiding all of my life and which has been plaguing the history of ideas since Plato. The universe is not based on dualism, but on monism.

However, the fact that everything which exists has an opposite does not mean that there are two principles such as the Cartesian matter and mind, or the Ying and the Yang; it means that the two opposites must be resolved into a higher third, which did not exist before. This is also why I am so found of those three Bach Lydian minor third series in the well tempered musical system. Musical composition also comes from the *Filioque*. Let me give you an example from the Peace of Westphalia. Take the first chapter of my 2013 report on **THE GEOMETRY OF THE PEACE OF WESTPHALIA.**

THE THREE-MIND-PROBLEM-SOLVING-PROCESS OF THE PEACE OF WESTPHALIA

Problem solving has been a puzzle for most people since the beginning of time. For instance, British imperialist, Thomas Hobbes, believed that every person has the right to everything in the world and, therefore, the greedy appetite of each and every one is justified in waging "***war of all against all.***" Such an infantile Leviathan principle only appears to be true because it seems to confirm that there has never been any time in the past when men did not wage war against one another. In fact, people who believe that silly principle are looking in the wrong direction in time and, therefore, cannot see that the future is what they should be looking into in order to put an end to war, permanently.

It took an extraordinary genius like Cardinal Jules de Mazarin a great deal of time and patience to discover a solution to this problem, and even after he had applied his unique solution to the Peace of Westphalia in 1648, the principle he had discovered was still not fundamentally understood, because people kept looking at the past instead of the future. Silly people simply thought the principle meant to

forgive and forget the past. That is silly because forgiving and forgetting are not axiomatic changes in physical space-time. The point is to abandon your own self-interest and concentrate exclusively on the future interest of mankind. In other words, the idea is not mutual benefit between you and me, but your benefit and the benefit of mankind, exclusively.

The British oligarchy, for example, has explicitly rejected that solution to the problem of war, because they know it means the end of their imperialist power. And, they are right. That's what the Peace of Westphalia was meant to do: eliminate the empire in all of its forms. That, in fact, should be quite obvious, because imperialism is based fundamentally on the principle of ***taking advantage of the other*** as opposed to ***giving the advantage to the other***. Permanent peace must start with the benefit of all of mankind, or else it's an empty shell.

An easy way to demonstrate how this principle works is to adopt the following triply-connected rule of conduct. Apply this principle and you will be able to solve the problem of war, permanently. The problem consists simply in finding congruence among three minds, or three nations, which are in conflict with one another. In a nutshell, the Peace of Westphalia came about when Mazarin discovered a triple relationship whereby the intention of France had to force the Austrian Habsburg Empire into agreeing to give the advantage to the Protestant German Principalities**.** The concept is simple, but the application difficult. This is how Carl Friedrich Gauss defined that same congruence in the opening page of his ***Disquisitiones Arithmeticae***.

> ***"With respect to whole numbers, a congruent relationship must be such that any power of a number C, which is divisible by another number B which is prime to C, must produce a remaindernumber A, which changes all the time as the power of C increases through an unending process of continuing least-action within the dynamics of A, B, and C as a whole."***

Imagine a strategic situation where, during the Thirty Years War, there were 16 German Principalities in alliance, or at war, with France and the Austrian Habsburg Empire. The alleged religious cause of the war is entirely irrelevant

because the solution to the war has nothing to do with religion. Each and all of those German Principalities had to change in order to become congruent with France and the Habsburg Empire through the process of the lasting Peace of Westphalia. In other words, the congruence between France, Austria, and the German Principalities had to be based primarily on the benefit to the German Principalities and their ability to create, for and by themselves, a sovereign German nation-state.

Let France be **C = 3**; let German Principalities be **A**, which is any number from **1 to 16**; and let the Habsburg Empire be **B = 17**. The only numbers that never change are **C** and **B**. As France **C** increases its power of forcing congruence between the German Principalities **A** and the Habsburg Empire **B**, any division between **B** and any power of **C** will produce a remainder **A**, which must become congruent with both **B** and **C** by eliminating the difference between them. The elimination of that difference is the axiomatic unity of action between the two dimensionality values of the torus which are expressed by the Toroidal action of **B = 17** and the Poloidal action of **C = 3** acting at right angle to each other. This process of congruence among human relations or among nations requires the satisfaction of the following three conditions.

1)When you have a conflicting situation between individual human beings, it is never the entities in themselves which are defective. It is *the process of intervals of action* that is disconnected or misconnected among them. If you reestablish the proper congruence among those entities understood as intervals of action, you will have continuous peace and harmony. If not, you will have discontinuous conflicts.

2) When the connection is missing, the way to restore it is to establish a function that causes *congruence among three unequal Minds*, or three unequal political entities such as a Sovereign-Nation, an aspiring Sovereign-Nation, and an Empire.

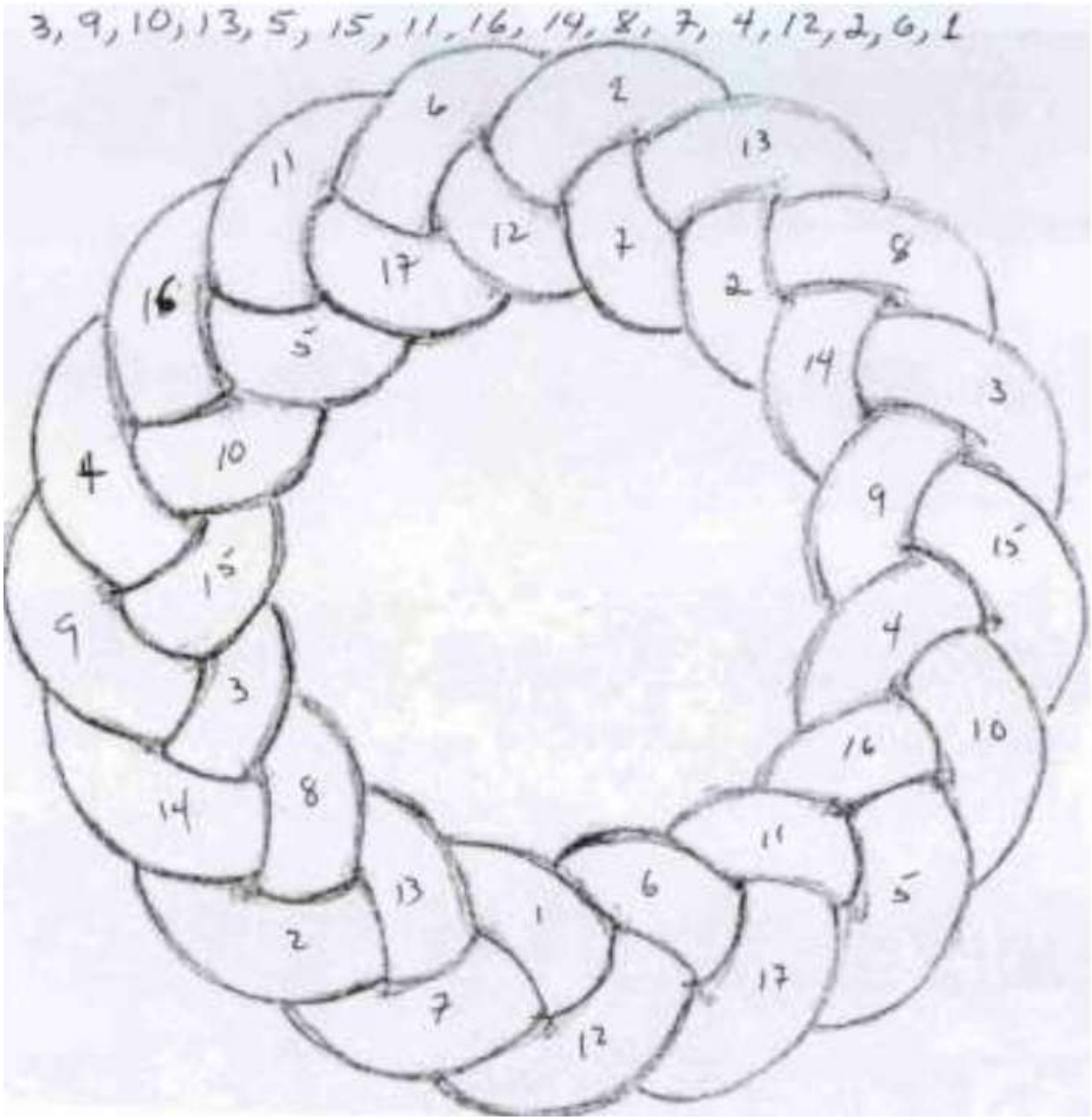
3) Such a function generates a pathway of least-action that establishes congruence everywhere by flanking itself at a right angle. The way to establish that flanking action and eliminate all obstacles to peace *must be to establish the*

Advantage of the Other as the dominating principle of conduct among any groups of three thinking individuals or nations.

This synthetic geometric process (*analysis situs*) can be apprehended easily by following the flow of each unit of action represented by the braided twists of the torus of **Figure 3** in a clockwise manner. If you are capable of creating a continuous least-action process around the torus in a manner such that you eliminate all obstacles created by the remainders **A** of any powers of **C** with respect to **B**, you will be able to cover all of the units of action represented by all of the strands of the knot in a continuous process of change, and obtain a total of **C (B-1)/2** circumferences around the entire torus. The series reproduced at the top of the torus indicates the ordering sequence of how many waves have to be counted as intervals of action in order to solve each of the non-linear singularities of change that comes from 16 triply-connected conflicts between **A, B**, and **C**. How do you solve this problem in the real world? You can only do it with axiomatic transformations of the minds involved.

This geometric problem can only be solved if one discovers the proportionality of harmonic ordering behind the dynamics of the three minds involved; that is to say, the harmony between reason and power among the different forces they represent, which is the only possible way of solving strategic conflicts.

For Mazarin, this was not a matter of conflicts between religions; this was a matter of thinking the relationship between reason and power in each case separately . As Leibniz developed in his ***Outline of a Memorandum on Arts and Science,*** if the wise wishes to stop a conflagration such as the Thirty Years War, he must strike a balance between what man is capable of doing and what he is capable of understanding. There is no formula for this sort of dynamics, but there is a dynamic form of harmonic proportionality which depends on truthfulness alone. As Lyn demonstrated, this is how the mind is able to increase its energy-flux-density.



Modular-wave-function of 3 (Mod 17). This modular process shows metaphorically how Mazarin solved the conflicts of the Thirty Years War. The braided twists of the torus represent the metaphorical process by means of which **16** German Principalities (A) established congruence between France (C) and the Austrian Habsburg Empire (B). The resolution of the conflicts is found by the non-linear ***intentional resonance*** of the whole process in such a way that the number of complete cycles of the entire torus corresponds to a total of C (B-1)/2 circumferences. In this case, **3 (17-1)/2 = 24.**

Take for example the case in which you wish to reach an understanding within a nation based on a government of the people, for the people, and by the people. That form of government expresses a balance between reason and power. However, if you weigh that idea against the power of an Imperial authority, like the Austrian Empire, you will inevitably end up in a Thirty Years War. Why? Because the power of that imperial authority was much greater that the understanding that existed among the parts that depended on it for their existence. As human reason develops, so must also develop the power of governing by reason. Otherwise, when reason and power are disproportioned, the result of the action always ends in tragedy.

All of the Greek and Shakespearian tragedies exemplify this fact. If, on the other hand, you create among nations a balance between the governing power and the reason of the governed, you will have peace; otherwise you will have war. In other words, it is the imbalance between power and reason which is the ultimate source cause of war. As Leibniz demonstrated, when this dynamic is applied to individual human beings and the imbalance is in favor of reason, the person will be oppressed by his own impotence. On the other hand, when the imbalance is in favor of power, the person will become oppressive by becoming tyrannical. Neither of those two options is desirable, because both situations are detrimental to the peace of the world. As Leibniz put it:

> "Thus hope and faith are founded on love, and all three on knowledge. Love is a joy of the mind arising out of contemplation of the beauty or excellence of another. 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 of what he is capable, and be capable of 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."[4]

Such was the implicit underlying principle of harmonic proportionality that Mazarin established as the measure of the Peace of Westphalia, and that is the form of reasonable action that solved the most critical problem of strategic conflict in the history of warfare. The key, as I will now show you, was to eliminate the Empire's power of waging war against the weak. Neutralize the Emperor and you win everything else. As I will now demonstrate, this is the dynamics that Mazarin used to neutralize the Habsburg Emperor with the creation of the League of the Rhine.

As for the question of the "double or multiple connectivity necessary for the organism's intention" I have no idea. I have never had the chance to study biology. I was hoping you could help me on this one.

As for relating "electricity and magnetism to double connectivity" I have used the oppositions which appear in the heuristic experiment of the homopolar motor. This is, in fact, what convinced me that this was the invisible motor of the galaxy. I remember Bostick talking about this homopolar question in IJFE. I have only recently come across a radio-telescopic projection of the idea. As far as I know, the electromagnetic Galaxy is doubly-connected like a Torus and Elsasser says that the electrical field of the Earth is toroidal while the magnetic field is poloidal. That made complete sense to me, but, I cannot find any writings by Elsasser on the Dynamo question.

[4] Gottfried Wilhelm Leibniz, ***On the Establishment of A Society in Germany For the Promotion of the Arts and Sciences***, Fidelio Magazine, Spring 1992.

Voila, that's the long and the short of it from the vantage point of history. I have been able to solve many other mental processes with this metaphorical process of the Torus, and the most exciting ones are in music. Whenever we are able to meet again, I will play some of them for you on the keyboard, especially, on how to hear the future coming.

Thanks again for the stimulating discussion. I will attempt to follow up on the rest of your letter later.

Pierre

PART TWO

Hi Ernie, 10/4/2018

I found what I was looking for with Elsasser, and it is completely revolutionary. I am only amazed that I had never discovered this before. I replicate below what I found in his book REFLECTIONS ON A THEORY OF ORGANISM. So far, his most significant contribution to epistemology and to biology seems to be his axiom busting Chapter 7. *Computer Models. Memory*.

MY OUTRAGEOUS STRONG HYPOTHESIS:

HOW THE SELF-GENERATING DYNAMO OF THE EARTH'S MAGNETIC FIELD WORKS LIKE A COMBINED MEMORY AND IMAGINATION PATHWAY

One of the most important needs to protect human memory from failing is the elimination of noise, as it is conceived by "Shannon's Law" for the protection against information degradation in a computer. However, in matters of axiomatic transformation, the notion of noise in computers is made to work in an inverse manner compared with human memory in axiomatic matters. In fact the solution to

noise in the human mind works opposite to what J. Von Newman had identified as "majority organ," or what I would call a "popular opinion function."

Von Newman considered that majority opinion was a way to eliminate errors in computers, but he never saw that it was the inverse with the human mind.

Take the example that Elsasser described as an application of the so-called "Second Law of Thermodynamics applied to information; that is, the "Shannon Law." Elsasser says: "*The need for protecting the information by a computer from degradation by noise constitutes a major task of the engineer*." (Idem, p. 77) He described how to solve the repetition of an error in a computer:

> "If I send one and the same message over a wire twice, then if an error occurs, it is likely to effect only one message since the error is a rare event, unlikely to be repeated. But I have no way of knowing which one of the two messages has been affected by error; in order to find this out, I must send the message three times; then if two messages agree and the third disagrees, probability considerations tell us that the third is most likely the one which is in error."[1]

This is a variation on the three minds problem as I have developed in my Peace of Westphalia papers. According to Elsasser, this "clumsy" reductionist process of the second law does not apply to living processes, because there are no counterparts of the living in the domain of non-living, and the time factor must be taken into account. His most interesting application of the failure of application of cybernetics to living processes is applied to "brain states."

Elsasser first looks at the brain as being similar to a cybernetic system, because he realizes that the factors of *speed*, *reversibility*, and *immensity of patterns* are quite similar; however, this is where the similarity stops because something different happens which takes quite a "spectacular form." Everything in the non-living domain is always the same. The atoms are the same, the chemistry of composition of two similar things are the same. He realizes, however, that for

[1] Walter M. Elsasser, *Reflections on a theory of organisms*, The John Hopkins University Press, Baltimore, 1987, p. 78.

living beings *"no two brain states are ever alike, either for the brain of the same individual at different times, or for the brains of two different individuals*."[2] That is a sign of non-entropy.

And the reason this is the case is because of the nature of a very specific aspect of the brain, which is to have a living memory. Elsasser makes the point that a living memory is axiomatically different from a so-called computer "memory," because it has *autonomous* (freedom) properties which the computer doesn't have. For that reason, when speaking of a machine, Elsasser makes the appropriate point of using the term "storage" instead of "memory," because the brain is not a machine. In other words, "memory is based essentially on a process of heterogeneous reproduction and not on the (replicative) action of storage devices, and this will require a great deal of discussion by experts before it can be generally accepted."[3]

Elsasser correctly considers computers as "stupid;" that is, "A computer, and its 'memory' (= storage device) can only put out what previously has been put into it." (p. 86) Therefore, a computer is stupid precisely because it lacks imagination. If a machine cannot make associations between things of different domains, like thoughts and images, for example, it cannot be creative. As Elsasser put it: "A computer is quite unable to produce any kind of association in the psychological sense of that term; it could never say 'this reminds me of…'" As a result, a computer is incapable of creating a metaphor. People don't realize the importance of this.

Most people are very impressed by the fact that a human being is capable of memorizing huge portions of a Shakespeare's plays by heart, and by fallacy of comparison, so will also do a computer; however, this is not what matters here. The point to be remembered here is on the "relationship" between memory and imagination, not the storage of its content, because memory has no storage. The pathway of transformation which I would like us to look at can be called, for lack

[2] Walter Elsasser, Op. Cit., p. 82.
[3] Walter Elsasser, Op. Cit., p. 86.

of a better term a memorizing imagination or an imagining memory, a sort of mnemagination.

Let's take this case as an example. What happened in your mind (not your brain), just now, when you read the word: "mnemagination?" Follow the pathway of your immediate memory as you investigate the coming together of those two words. A new connection has been made between two human functions, a connection that did not exist before was create between your memory and your imagination. This connecting phenomenon has always existed before, because this is how the creative mind works, but the term that I chose for it is new and never existed before. Mnemagination is the performative epistemological concept which relates to all forms of axiomatic transformations between memory and the imagination as the living analysis situs of what Elsasser called "memory without storage." This is how the *coincidence of opposites* works; this is how the electric field and the magnetic fields also work as one electromagnetic system.

This is the amazing conclusion of Elsasser, which is an improvement on what was expressed by Henri Bergson in his 1896 book, *Matter and Memory*; that is, where memory should no longer be understood as a storage area but as the connecting device of the creative imagination. Memory is the universal analysis situs of innumerable exchange and transformations of ideas, across human history, somewhat like a living-historically-connected telephone exchange system. I can only be thrilled that Elsasser felt compelled to add to his revolutionary epistemological discovery, the following historical axiomatic change and make a call to some of his closest historical friends. As he said:

> "There is one notable thing about Bergson's idea: so far as it could be considered a scientific hypothesis it was purely negative, and so inadequate. It needed therefore to be built up into a genuine theory which embodies the concept of *memory without storage. I suggest therefore that the idea, ultimately going back to Bergson, of a memory lacking the mechanistic side of storage, be made the focal point of a holistic thinking.*
>
> "But the obstacles that stand in the way of an acceptance and elaboration of this idea are not in the nature of technical complications in

> abstract thinking; they lie very largely in the mental attitude of biologists; Biology has in the past always managed to get by with the existing, essentially Newtonian models of space, time, and causality (except for the replacement of Newtonian concepts by quantum-mechanical ones, which is a matter of the underlying physics and chemistry). ***Here for the first time in history the biologist has to face squarely his own epistemological problems*** (emphasis in original): They are condensed in the phrase, 'memory without storage.' The advantage of the physicist, which consists in having a long tradition in attacking and ultimately solving epistemological problems, cannot be gainsaid. This tradition begins with Copernicus and Galilei (who demolished Aristotelian physics) and ends with Plank and Bohr (who succeeded in transforming Newtonian physics into quantum theory). Now it is the biologist's turn. ***The time has come to face and digest the concept of 'memory without storage.***''[4]

Yours,

Pierre

Hi Ernie, 10/4/2018

If I delayed in responding to you, it is because I wanted to take more time to think about how to reply to the second part of your email of September 27th ; keeping in mind the idea of the *doubly connected mnemonic and imaginary pathway* as was originally designed by Elsasser as a mental electromagnetic dynamo; that is, as a sort of homopolar mental process where the poloidal and toroidal opposition of forces act like the Earth's electromagnetic field as opposed to the imaginary idea of a storage of energy. I think that Elsasser may have used combinatorics as a sort of transfinite function for his combinatory configurations, something akin to polyhedral combinatorics. I would appreciate if you can check that out for me in his *Reflections on a Theory of Organisms*, p. 31-32.

[4] Walter Elsasser, Op. Cit., p. 89

Anyway, I see your idea of interconnecting living principles as a Riemannian Manifold in that same way, but I am wondering how you are going to characterize them as expressions of elementary universal physical principles? I tend to think of it more simply as a doubly or triply-connected manifold, where two or three forces of circular action are unified by way of *unity of opposites*.

However, this has to be conceived metaphorically; and that is the difficulty that most people have with Lyn's method. Lyn base this method on the metaphorical principle which defines an absolute limit to the boundary conditions of our epistemological capabilities for both memory and imagination as Cusa expressed it in his last paper on *Possibility Itself* (***De Apice Theoria***), and that is where the human mind is bounded from the top down by a triply-connected geometrical limitation, as Charlemagne attempted to express his creative principle based on the Trinity principle of the *Filioque*. Think of the *Filioque* as Kepler did, geometrically, as a triply-connected result of spherical action. There are two stumbling blocks here; one is religious because the Catholic Church never recognized such an epistemological aspect of the *Filioque*, and the other is scientific, because modern science has not yet understood Riemann for the vantage point of Lyn; that is, from his conception of a geometrical Transfinite.

I found that in his later years, Elsasser understood that he was thinking from a higher level of the transfinite and was able to generate spurts of higher energy-flux-density; but, I also found that he was not able to navigate the higher sphere, as Lyn does, because of his catering of public opinion of his peers; and, as a result, he was unable to integrate science and artistic composition. That is also the biggest the flaw that I find in our own members more generally. The problem is that Lyn's metaphorical axiom busting method is not being internalized and applied to the organizing process. I think that your idea of hormones, for example, which have an effect on several domains is something useful to look into from this standpoint, but strictly from the vantage point of epistemology. That is why I am fascinated by your question: *"how do they come to interact creatively?"* That is to me the most important question, but it can only be answered from a higher standpoint of epistemology where, the correlations between science and mental processes

borrow the same pathways as does classical artistic composition, especially music and painting.

Let me give you an example of how I see this matterofmind as a doubly-connected manifold in terms of the strategic situation. First of all, I look for a metaphorical connectivity as in the double-connectivity of the Torus; that is, I look for two *opposite forces* and I ask myself: How can two such opposite forces come together as one under the principle of the Peace of Westphalia? Take the example of how Helga recently identified the two forces involved in the current strategic situation: *"The centrifugal force of the collapsing financial/geopolitical system in the West, near to blow-out; while, second, there is the unifying vector towards deliberate development and peaceful relations, expressed by the initiatives of the BRICS, and by the New Silk Road involving China, Russia, African nations, and others, and moving into South America."* (***China-USA Tensions Stoked, Amidst World Turmoil; Push Break-Out to a New Bretton Woods.)*** It is interesting that Helga would speak of the "centrifugal force" because this is the toroidal circular action which pushes a planet outward, while the poloidal circular action is the inclusive circular action that keeps the planet within the orbit.

How do you find the unity of those two opposite strategic forces? Finding such a unity requires an axiom busting moment of change where minimally three national leaders must agree to break the deadlock between those two contradictory forces and stand steadfast before the entire world. I could easily imagine how this could happen in a meeting of World Leaders on the subject of Lyn's "New Bretton Woods" development proposal, which could take place among, for example, three sympathetic entities such as Italy, China, and the U.S.; that is, they come to an agreement for the development of Africa. Isn't that also how the Ricercar Musical Offering of Bach is used to solved dissonances of the Well Tempered System in a triply-connected way? Isn't this is also how the Peace of Westphalia came about?

That's the way I see an axiomatic change working. The problems get solved by involving three minds who accept to go into an inversion where their own self interest is replaced by the benefit of another. I have not yet seen any aspect of this sort of inversion anywhere in the writings of the younger generation of our

members. If you know of any member's work which reflects such a principle of congruence, please bring it to my attention as soon as possible. For example, how does this apply to what you say when you write:

> "The virtue of Ben's work is what flows from his discovery that by multiplying 1. the scaling relationships of the cycle duration in time to the mass by 2. The scaling relationship of metabolism to mass, you get energy flux density per unit of mass otherwise known as action, the integral of energy times time. which is relativistically invariant!. This, as Ben points out, coheres with Vernadsky's biogenic migration of atoms and Lyn's energy flux density in economy, thus giving us potentially a "strong hypothesis" characterizing three different antientropic domains. Lyn's discussion of "relativistic economics", see EIR Volume 36, number 36, develops this strong hypothesis. Perhaps it was the fascination with "information" as opposed to energy, or worse yet, the popular idea that information is in a sense interchangeable with energy, that distracted Elsasser."

What scaling relationship are you talking about? Please, explain more precisely what you mean in the above statement and give me some precise references to Ben's work that you want me to consider.

I think you are right to search for Elsasser's higher hypothesis, because I am also looking for it and I have not found it either. Something very simple must be guiding him because he has extraordinary moments of unexplained enthusiasm, which is an indication that he's got something driving him, but I also find him very secretive. Sometimes I have the impression that he is afraid to confront the established authorities with axiom busting ideas. You may be right about his "popular opinion" proclivity. That may be his Achilles' Heel.

I can also see an important similarity in the way that you and I think: you discover discontinuities and phase changes in the domain of relativistic physics while I discover them in artistic composition. That's good, but I just don't have the scientific background that you have and therefore I cannot follow you in the details of some of the things you say. However, I can understand the gist what you are saying when you write:

> "For some reason, I associate relativistic effects with phase changes and formation of singularities. I have a particular question: the log log plots by Linstedt and Calder portray changes in the EVOLUTIONARY phase space. But what is the implication for the phase space of the INDIVIDUAL organism? I think perhaps what is implied is that homeostasis requires a particular curvature of the phase space for the particular species, and that departure from that curvature is harmful. To support that idea one would need to show that physiological adjustments maintain the appropriate curvature of space time in living matter, and I don't see yet how that is to be determined."

I can understand the gist what you are saying; but, I would like to know more about "relativistic effects" and would appreciate some choice examples. I fail to see the epistemological significance of allometric scaling that Lindstedt and Calder are using for relating the different magnitudes of biological parameters. Are you treating these equations as absolute boundary conditions in evolutionary processes? What am I missing here? What is the epistemological significance of a log log plot? Are you looking for a power relationship or an axiomatic transformation? Are we looking for the same thing? I may be asking silly questions because I don't have a scientific background; you see, the closest I come to science is through constructive geometry; and that is my only validation principle. It is only my personal philosophy of science background which helps me look for the epistemological footprints that non-recondite scientific personalities have been good enough to leave behind in their observations of things. I have to confess that I have very little understanding of the majority of what comes out of the current scientific domain.

My best insights in science came when I discovered the work that Tony Peratt did on the Plasma Universe. His brilliant work spurred me into developing an amazing proportional connection among theology, epistemology, plasma physics, and music. Tony Peratt was so excited about my reports that he sent me a copy of his groundbreaking *Physics of the Plasma Universe*. This is what I wrote about his work, including the doubly-connected Solfège Torus: ***ANTHONY PERATT'S LEAST ACTION PLASMA UNIVERSE*** and ***THE COSMIC-***

TRIPLE-JUMP OF THE PLASMA UNIVERSE. You may be interested in pondering the higher hypothesis of proportionality that I got from Tony and which you can find in the first of those two reports:

> "Moreover, it is also ironic that among the top original thinkers in Plasma Physics, most notably, Hames Alfven, Winston Bostick, Tony Peratt, and Dan Wells, to mention only a few of the early ones, only Peratt succeeded in applying that principle of correlation based on the proportionality between Laboratory Plasma and Interstellar Plasma. As Peratt reported: "In fact, the 3D particle-in-cell simulations of space plasma, a topic pursued by myself under the guidance of Prof. Hannes Alfvén, Royal Institute of Technology, Stockholm, for 23 years and Prof. Oscar Buneman, Stanford University, for 12 years depict the profiles over the full electromagnetic spectrum." (Personal correspondence) Just to remind you that this is what I had most emphatically emphasized in my 2012 report on ***THE PLASMA UNIVERSE IS A MATTER OF MIND***."

As for Elsasser, I am afraid to attribute an anthropomorphic meaning to his idea of freedom of an organism, because I fear that Riemann may be right in attributing such a freedom only to evolutionary phylogenetic processes as opposed to organic species or individuals. As for the "organism's ability to make choices," I agree with you, but I tend to look at it as a similar choice that light makes when it changes direction in the more or less density of a media that it is going through. In that sense, there can be no axiomatic choice for any living species, at the exception of the thinking one.

The fact that organisms can reach destination by different phylogenetic paths is to me a good example of how musical composition works, because it is the relationship of the doubly-connected curvature which does the work of maintaining the cycle of life in accordance with its prescribed pathway and cycle, in spite of the particular obstructions that may be encountered along the way. Adjustments are made along the way, but the pathway is already preestablished by the phylum. This applies also to the human mind. When certain foreseeable obstructions are put before the mind, depending of the

epistemological maturity of the subject, most minds will take the same pathways by avoiding the same obstructions or by superseding them.

I am happy that you brought up the question of Gustave Fechner, because he was probably the most significant epistemological axiom buster of the nineteenth century to break up the Cartesian ideology of the fallacious Aristotelian duality Mind-Body. However, from a very early age, I considered his deductive logical approach too stiff for my rebellious esthetic blood. I found that he went too far in the opposite Cartesian extreme when he decided to quantify the domain of sense perception and then went deliriously into mysticism. He was as precise in his quantization as Descartes was clear and distinct in his ideas; they are two birds of a feather. I did not agree that plants had souls either. I find he has very reductionist ideas in psychophysics, and I have always believed he was wrong in giving priority to physical world over mind. Fechner believed that all psychological phenomena depend on physical preconditions. I think this is a terrible form of reductionist empiricism. It is the opposite which is true.

I actually believe the opposite as Lyn does; *that every mental axiomatic change is a precondition for a physical change in the universe.* In other words, it is in man's power to change the universe. The problem with Fechner is that everything in the universe can be explained exclusively by physical laws. I have always believed that it is mental processes which create physical reality, and not the other way around. This is the reason why I believe it is God's Mind that created the Physical Universe, and He did not need a brain to do it.

What happens when the individual human mind changes the physical universe as a whole? Here, Fechner's underlying assumption is that the axiomatic change which takes place in the human mind must be caused by physical laws. This is where Fechner's epistemology is flawed. He never allowed for the experience of mind to be causal in the universe. In that sense, Fechner rejects the existence of all transfinite and metaphysical causality. Too much deductive logic spoils the soup.

I don't know anything about Beloussov; I just hope he did not also introduce another mechanistic approach to biology.

All the best to you,

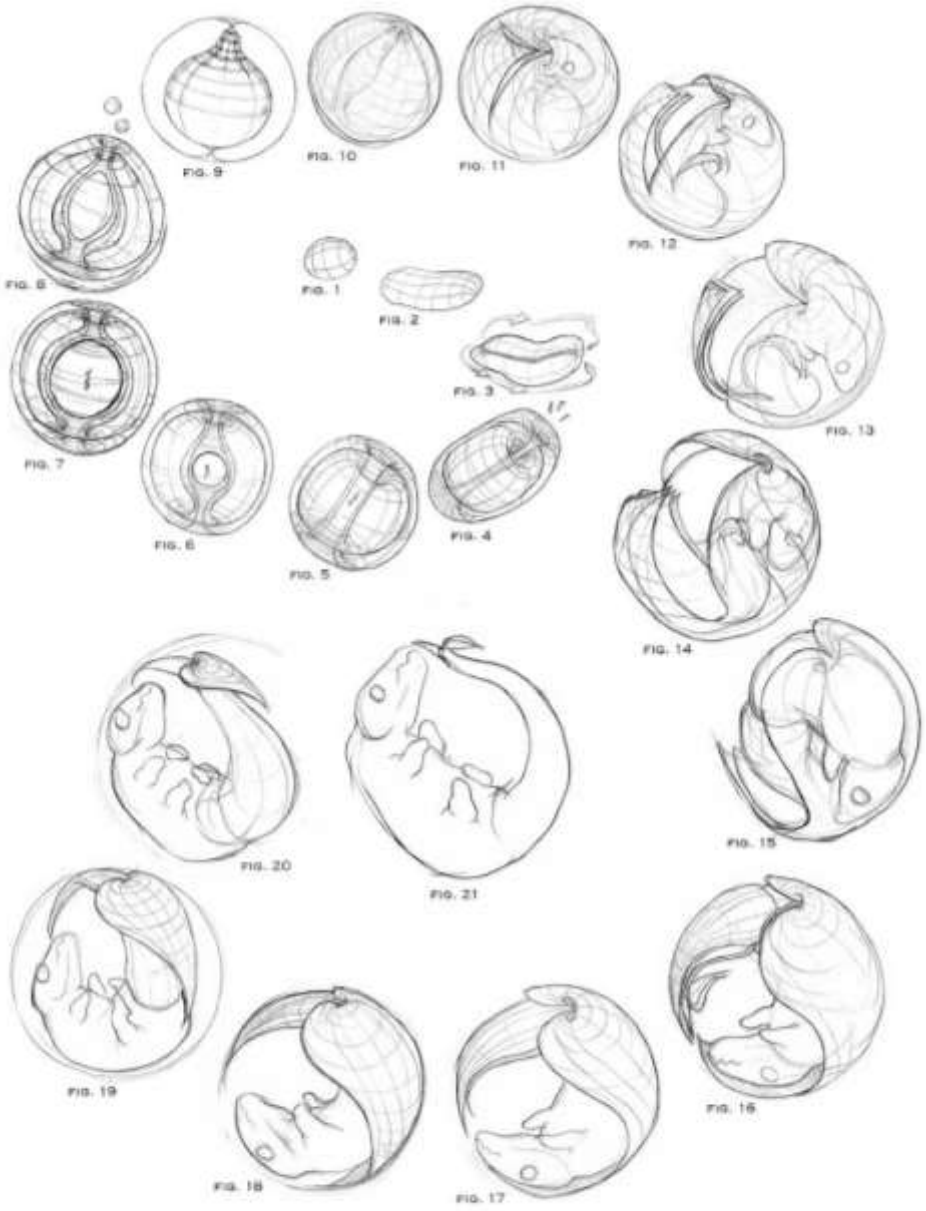
Pierre

P.S. If you agree, I would like to eventually turn our correspondence into a special report that I will upload on my Galactic Parking lot. It could be useful for some of our younger members.

Hi Ernie, 10/13/2018

One look at Stuart Pivar, ***On the Origin of Form***, and I could see that his consideration of spherical and torus geometry is more than a reductionist mathematical coincidence. He recognized that nature itself has chosen a doubly-connected form of circular action for most living processes. As he acknowledged: "The author's laboratory, comprised of scientists and scientific illustrators, has demonstrated that the body forms of the animal and plant phyla can be actually simulated by the deformation of an elongated sphere with an internal canal connecting front and back - a topological surface in the category known as the torus. And that one torus within another can account for many complex biological forms, from the shape of a fly, a flower, or a human, to the stripes on tigers and zebras, and the patterns on butterfly wings."[5]

[5] Stuart Pivar, ***On the Origin of Form***, North Atlantic Books, Berkeley, California, 2009, p. xiv.



VERTEBRATE DEVELOPMENT
PLATE 22

However, he doesn't push his investigation any further into how the torus might some epistemological implications in other domains of knowledge. That's too bad. I guess it's our job to do it. I also bring to your attention the fact that the mirror effect of right and left chirality in living processes is a characteristic of the doubly-connected reciprocity of the torus.

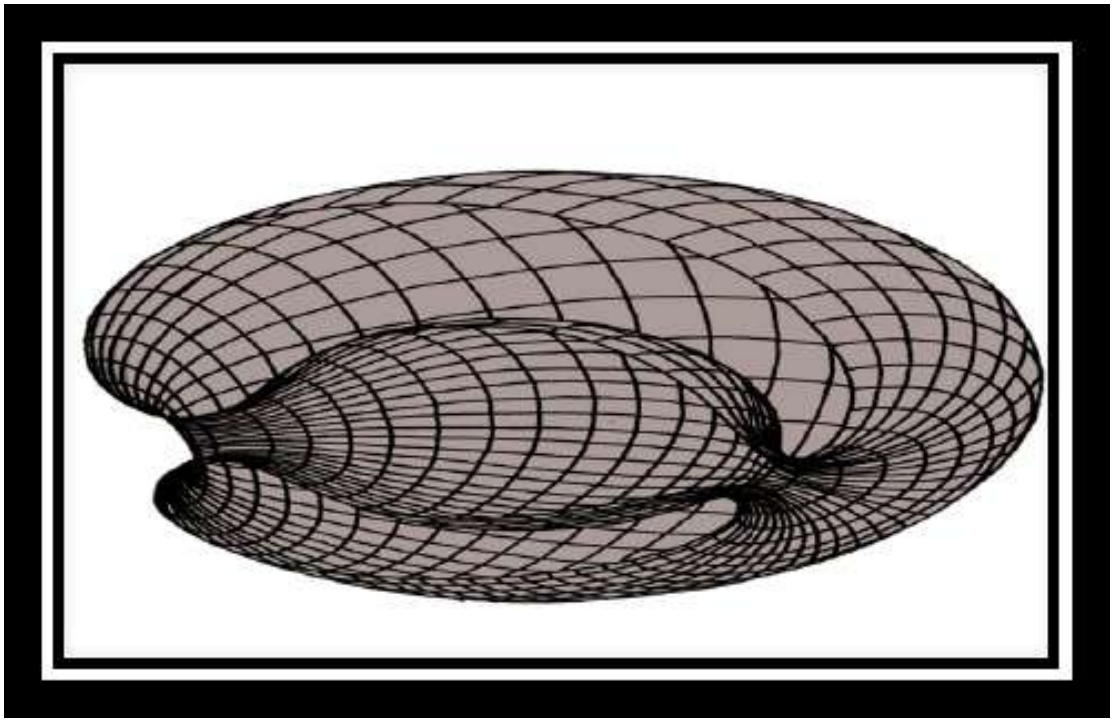
Paleontologist, Mark McMenamin, also developed an amazing torus shaped construction for a Namibia fossil called *Vendoglossa tuberculata*, which was discovered by Seilacher, in 2007, and which is dated back to the Cambrian period.

"Vendoglossa tuberculata Seilacher, 2007. Cast of fossil in fiberglass painted and stained to enhance contrast. Original specimen held in the H. Herni Collection, Namibia. Scale bar in centimeters."

McMenamin called this "abrupt transition" period the "Cambrian Anomaly" which represents the axiomatic transformation period when the modern animal phyla begins to develop. McMenamin noted this axiomatic moment as a geometric- epistemological moment of transformation in the evolution of life on Earth and as a moment of change in the human understanding of living processes as a whole. He wrote:

> "This anomaly, this gap in our knowledge, this cognitive unconformity, is a collective embarrassment for science in general. Because of this, we are entering exciting times in biology. We might call this the age of post-natural selection evolutionary biology, in other words, a kind of post-modernism for the natural sciences. The Darwinian fixation on natural selection and its consequent pan-selectionism have proved inadequate for the demands placed upon them, and now we must look elsewhere for a fuller

understanding of the evolutionary process. A paradigm shift of the first order is in the process, making this an especially good time to review our understanding of the scientific process as we seek a way forward."[6]



"A computer generated image of *Vendoglossa tuberculata* Seilacher, 2007, as a toroidal membrane, modified from Julicher (1993) and Pivar (2004). Note the convergence of longitudinal lines near the poles."

What McMenamin goes through is an attempt at addressing the deficiencies of Pivar's work by "evaluating Multi-Torus or Morphogenetic Torus Theory using fossil record." The problem I find in his approach is that he doesn't proceed from epistemological principles but from sense perception look-alike curve fitting. This might well be just a conscious limitation of scientific observation on his part.

However, I have some doubts about the Rene Thom approach to morphogenesis, especially his morphogenetic fields associated with catastrophes.[7]

[6] Mark McMenamin, ***Paleotorus: The Laws of Morphogenetic Evolution***, Meanma Press, 2009, p. 5-6.

He has no sense of principle and he lets himself be guided by his mad war-catastrophe mathemagics. The guy is a madman fascinated by destruction. His idea of creativity is a "generalized catastrophic destruction of symmetry or homogeneity." (p. 103) The whole thing eventually leads to the insanity of fractals.

From: Ernest Schapiro [mailto:ernestschapiro@gmail.com]
Sent: Tuesday, November 13, 2018 10:53 PM
To: pierrebeaudry@larouchepub.com
Subject: Thoughts on Elsasser

Hi Pierre:

Elsasser has greatly provoked my thinking and I think I am beginning to put together observations that till now have not been explicable. The basic idea is what I see as the implication of his discovery that organisms are creative rather than automata. The organism is continuously recreating itself. It also makes errors, unlike a machine. The first example of this was observed by Dr. Rudolph Schoenheimer in the 1930's at the Columbia University Dept of biochemistry. He was one of the first to have access to isotopes of hydrogen, carbon, and nitrogen and fed rats labeled fats. The diet was sufficient to maintain body weight. Yet after a few days, their depot fat was heavily labeled. One would expect the ingested fat to have been simply used for fuel rather than deposited and then broken down. In 1959, Harry Eagle at Einstein found that cells in culture with labeled amino acids in the medium (the building blocks for proteins) also had this phenomenon. Moreover, it continued even though inhibitors of protein synthesis were in the medium so no net synthesis of new protein could occur.

Recently Dr Dale Bredesen has shown the crucial role in Alzheimer's disease of a receptor molecule that is needed for the taking down of synapses in the

[7] Rene Thom, ***Structural Stability and Morphogenesis***, W. A. Benjamin, Inc. Massachusetts, 1975.

brain and the formation of new ones. He has developed a successful treatment for early cases and other kinds of cognitive loss by selectively targeting that receptor molecule with ligands(agents that bind to and activate it) which favor forming new synapses. So the brain is also reconstituting itself. His book is called *The End of Alzheimer's*.

In the last decade there has been development of a whole new area of cell biology, the phenomenon of autophagy. The word means self eating. What goes on in the cell is a continual recycling of its structures, except perhaps the nucleus. In the cytoplasm bilayered membranes form and engulf structures to be broken down into their amino acids and lipids to be reutilized. This includes also a special mode of disposing of improperly folded or otherwise dysfunctional proteins. (seemingly the result of error or metabolic injury due to free radicals.) It also includes whole mitochondria being engulfed and broken down. There is thus a continual baseline activity of this sort and it takes on greater significance under various conditions of stress or disease.

On a larger scale, Dr. Jack Shields in 1970 wrote The Trophic Function of Lymphoid Elements in which he described the unique functions of the body's most mobile cell, the small lymphocyte. It has a short life time and in addition to its antimicrobial function it travels from the lymph nodes or other lymphatic tissues like the spleen, bone marrow, and thymus where it originates to other tissues which are rapidly reproducing themselves and donates its DNA and protein to them. So the lymphocytes are involved in a vast recycling program. This dual function has not been adequately considered, especially its nutritional or trophic(growth promoting) aspect. Among the rapidly growing tissues it nourishes are the lining of the small intestine and the lymphocyte producing tissues.

These phenomena suggest to me something related to Vernadsky's biogenic migration of atoms. This occurs at faster and faster rates as evolution progresses. Consider the rate of turnover of material for example in a field of grass compared to a forest . In the field, all the grass ends up decomposing at the end of its growing season. See Ben's article relating energy flux density to biogenic migration of atoms.

https://21sci-tech.com/Articles_2013/Spring_2013/Biospheric_EFD.pdf

In his 1970 book Complementarity in Biology; Quantization of Molecular Motion, James Isaacs called attention to the Schoenheimer phenomenon. He argued that events in the cell are often quantized, and that quantization is a way of ensuring that the statistical conditions for determinacy are not met. In his view, quantization of a process implies that one can't explain it mechanistically. Limitations placed on the lifetime of the cell or its constituents maintain this condition. I think he has things upside down, but he has the great virtue of calling to attention a lot of anomalies. I see quantization as perhaps an expression of self organization and the life principle. . Take a look at this letter by Martin Ruderfer.

https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=4050900

Ruderfer was also the first I know of to show in humans that action (the integral of time and energy) is constant over a lifetime. He also noted that action is invariant in special relativity, which has important implications for Ben's discovery regarding the relationship of mass to metabolic rate and to the length of cyclic processes i.e. to time. Just as Lyn has identified relativity in physical economy, Ben has identified it in biology. I'll send you Ruderfer's article on that. Isaacs references Schoenheimer, Eagle, and Ruderfer, and cites Elsasser a few times. So he has pointed to an important area even though I don't think his explanation is fully satisfactory. He seems to hope one can reduce biology to a more advanced view of quantum mechanics.

More to follow..

Best wishes,

Ernie

11/13/2018

Hi Ernie,

I agree with what you are saying: the living universe is a self-generating system of change and transformation. This is something that the non-living is incapable of doing. To me, that is entirely coherent with a state of creative-mental process of the human mind, except that our minds are capable of accomplish axiomatic changes which life cannot do.

Ironically, such a self-generating mental process is also ho the universe works; it acts to change physical-space-time axiomatically in the simultaneity of eternity through negative curvature to such an effect that if you want a better future, you must change past, present, and future. This is probably the reason why the human mind is immortal. Life cannot do this; it can only go back to its maker in a degenerated form.

This is also why I don't think there is a magic bullet for Alzheimer's disease, except a temporary slowing down of irreversible degeneration of life thanks to the creative-mental process of solving paradoxes.

I will add your insightful comments to our dialogue and await your further remarks.

All the best to you,

Pierre

Hi Pierre: 7/28/2019

I enjoyed your several recent articles on Arago, Ampere, and Fresnel. Perhaps you can elaborate, more explicitly the Leibnizian nature of Ampere's approach to electromagnetism, including the infinitesimal current element and the role conic spiral action around the current carrying wire in causing the magnetic field. I found helpful your account of the triply connected action in electromagnetic wave propagation, i.e. the perpendicular electric and magnetic actions and the action of propagation in yet a third direction. I have been thinking a lot about how singularities only occur if you have a multiply connected action. Examples might be the release of a discrete photon from the supposedly diffuse and continuous Maxwellian field in the photoelectric effect, and the phenomenon of pair production from gamma rays. In Carol White's 1977 book Energy Potential, she describes what she calls potentiation as one goes from the static charge, to the current, to the electromagnetic field, to the fusion plasma shown on the cover. The sequence suggests to me a kind of self organization or antientropy.

The last speaker at our July 20 event in new York, Mr. Goria, speaking about lighthouses, featured a revolutionary lamp for lighthouses invented by Fresnel. You might want to write something on that as a continuation of your recent articles.

I am forwarding you what I hope will be an article on the application of Lyn's Riemannian model to the individual organism in its embryology, evolution, and actual functioning. The ideas that have gone into it so far came to me gradually over the years as answers to specific nagging questions, i.e. organically, rather than I believe by what Lyn characterized as the syncretic growth by which a caddis worm builds up its shell out of fragments of flotsam. My hypotheses are still preliminary, and were helped greatly by the particular way you called my renewed attention to Elsasser. He has given me the bridge from the work of James Isaacs, which I first read in 1970, to Lyn's ideas.

In that regard, I hope to elaborate a notion of creative self organization as opposed to purely mechanistic behavior. The now widely recognized biological phenomenon of hormesis seems to me a case in point. You, may recall the

numerous articles on radiation hormesis in TCS, i.e. the beneficial effect of small doses of ionizing radiation below a certain threshold. Professor Ed Calabrese of U. Mass. has devoted decades to demonstrating the ubiquity of hormesis. There are hundreds of instances, and in each instance, a particular set of biochemical reactions is cited as mechanism. Isaacs devoted lots of attention to hormesis as expressing a law of biology and hypothesized that it was quantal i.e. in his view non-mechanistic. My view based on Elsasser is that the creativity of the organism utilizes a mechanism but as an aspect of creative self organization. Elsasser in Reflections on a Theory of Organisms cites self organization in plasmas. So I think hormesis is an expression of antientropy. I am rereading the work of Lev Beloussev on embryology, in which he shows that the successive stages of development are not programmed but express a capacity for self organization, delimited by the boundary condition of the total organism, rather than being built into a particular region of the embryo. He suggests that mechanical stresses which are maintained by energy supplied are what drives successive stages but in a way modified by the self organizing ability of the embryo. If hormesis can be shown to apply here, it will be very strong support for my view of hormesis in general as self-organized.

Another aspect of Lyn's work which is relevant to biology is negative curvature. He postulated that wherever a singularity is formed, there is a negatively curved surface that represents the combined actions leading to formation of the singularity. Thus the body form of most animals is a torus, which in its elaboration generates further tori. See Pivar, *The Origin of Form*. Pivar is an artist. Lyn cited the correction of Riemann's notion that one can represent the transition from one Riemann surface to another by a point. Beltrami, according to Lyn, showed that the physical representation of this process must involve a region of negative curvature. Lyn also observed that when a new technology is introduced into the economy, there is a period of relatively negative curvature representing the work done in upgrading the economy. Do you recall such a reference? Larry Hecht had an article in TCS called potential in a Space of Negative Curvature, wherein he discussed light refraction by lenses and Iceland spar crystals, and the discovery by Meusnier

of the development of a helicoid out of a catenoid. He related this to conversion of mass into electromagnetic energy.

In evolution, there is a relatively precise relationship of calories consumed per gram of tissue per unit of time in cyclic processes. It is a constant for most of the placental mammals, and a different constant for birds. It involves an inverse relationship of body mass to rates of energy consumption per gram. This inverse relationship might again represent the negative curvature of a phase space.

In the Lippmann book, in the chapter Aristotelianism and Nominalism, there is a quite remarkable section starting page 54 on the paradoxes of the field particle derived notion of energy, and asserts on page 55:"that there must be an additional magnitude of energy of some kind in material processes above and beyond the magnitude implied by notions such as "the conservation of energy." I think this must have crucial implications for biology, where we have highly negentropic processes which would show a large such additional increment.

I am devoting a lot of effort to studying the method of characteristics for solving partial differential equations. My purpose is to understand Riemann's work on the shock wave, which is based upon that method, originally developed by Monge. Have you studied it? It is also useful for understanding Hamilton's equations in dynamics, which are a necessary predecessor of quantum mechanics.

Your friend,

Ernie

Hi Ernie, 7/30/2019

Good to hear from you again. I am very happy that you sent me this email today because it brings a beautiful closure to our discussion of last year. It took a few months for both of us to digest this material, especially the question of

negative curvature and its negentropic implications. I think you will have the same results as I got with Ampère, if you apply this idea of negative curvature of increasing energy-flux density among the progressive stages of static charge, current, electromagnetic field, and fusion plasma. Something similar must take place in self-generating living processes. You are right, singularities take place in a multiply-connected fashion, mostly in triply-connected ways through Lydian Quadratics.

I am happy you have found my investigations onto electro-dynamics useful because what I was looking for in Elsasser I have finally found in Ampère. I could not believe it when I discovered that Ampère was a first class epistemologist and that he had applied his electromagnetic principle of repulsion/attraction to the domains of epistemology and psychology; and most effectively to the triply-connected least action as Lyn did with his Prometheus Principle. See more specifically my memorial to LaRouche and the Adam sculpture: **THE LEGACY OF LYNDON LAROUCHE WITH AMPÈRE AND FRESNEL.**

Ampère's use of Lydian Quadratics and of the Leibniz logarithmic divisions was the key to my discovery of the Lydian principle, which is not only constructible geometrically, as I have done with the arithmetic/geometric mean of the logarithmic conical spiral, but which is also coherent with Lyn's outline of the transfinite/negentropic ordering principle as applied to the voice register shift. The secret can be found in Leibniz's idea of Felicity. Ampère called this domain *Mathesiology*, or the knowability of knowledge which he described as follows:

> "Whatever the object of his studies, man must first assemble the facts, whether physical, intellectual, or moral and it is then necessary for him to seek what is in a way hidden under these facts. It is only after these two kinds of investigations, which correspond to the two subordinate points of view included in the first principal point of view, that one is able to compare the results obtained up to that time, and deduce from them the general laws; that is, the comparisons and the laws which belong also to the third subordinate point of view. Then, the investigator can go back to the causes of those facts which he observed under the first, which were analyzed under

> the second, and compared, classified, and reduced to general laws in the third: this search for the causes of what he has learned in the first three points of view, and that of the effects which must result from known causes, constitutes the fourth subordinate point of view, and thus completes all that is possible to know about the object we are studying.» (André-Marie Ampère, ***Essai sur la philosophie des sciences, ou, Exposition analytique d'une classification naturelle de toutes les connaissances humaines***, Mallet-Bachelier, Libraire-Éditeur, Première Partie, Paris, 1856 : IRIS; Seconde Partie, Paris, 1843 : IRIS.

Ironically, this quadratic question of knowability of knowledge is not simply a so-called logology or theory of knowledge, and it has nothing to do with artificial intelligence either, as cybernetics would have it; it is a cautious probing (tatonnement) of a discovery of principle as Lyn exemplified in his ***Prometheus in Europe***. The sculpture of "*Prometheus bound*" by Nicholas-Sebastien Adam is also an excellent representation of Ampère's triply-connected electromagnetic principle as I have shown in **Gene Schenk's Memorial.** All of this may take some time to sink in, but when it does, the reaping of the harvest is wonderful. The whole question is how to get ready for it. Meanwhile, I will keep following your investigative leads.

I have compiled our discussion of last year into a document (see attachment) that I would like to upload on my Galactic Parking lot; but I need your stamp of approval. I need you to read it and make whatever correction you wish to add and send it back to me when you are done. I think this dialogue might be useful for the younger generation of alphestes.

It is always rejuvenating to dialogue with you. Let's keep our minds young,

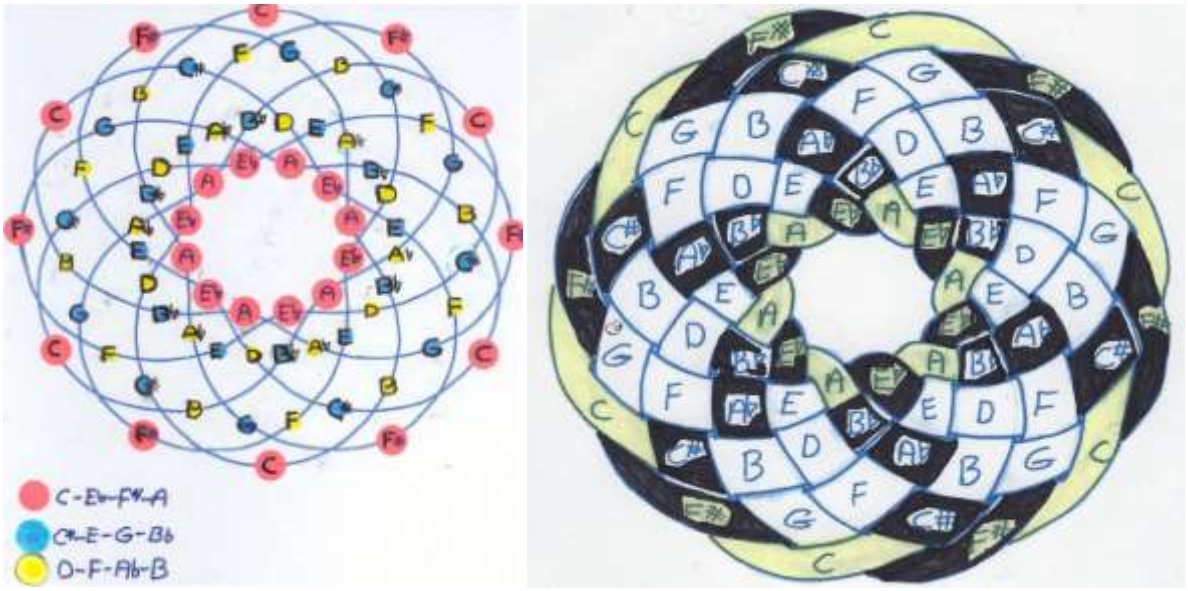
Your friend,

Pierre

P.S I have heard that you are working with a medical team on memory. This is of personal interest to me because I have a condition known as Global Transient

Amnesia, which is the reason why Gerry Rose took me off of the phone team about ten years ago. The condition has been significantly reduced since I have been in a less stressful environment, but I still get mild flare ups of it a few times a year.

The way I was able to resolve this medical condition was through the use of the musical Lydian spiral modality, because this is the dissonant singularity which has helped me remember Bach and Beethoven piano pieces during the past sixty fine years or so. After long periods of not playing those few pieces and forgetting everything, especially the First Prelude of Bach and the Beethoven Sonata Opus 27 which I learned by ear at the age of 15, I could only play them again by reconstructing them again through the spiral actions of these Lydians. I have written about this musical matter in a series of reports. See **http://www.amatterofmind.us/classical-artistic-composition/european-art/music-book-iii/.** That is my musical/electromagnetic contribution to Lyn's epistemology. The beauty is that the modality has the power of bringing the future into the present. It may have some medical interest as well?



Here is my well-tempered bagel.

FIN