

TABLE OF CONTENTS

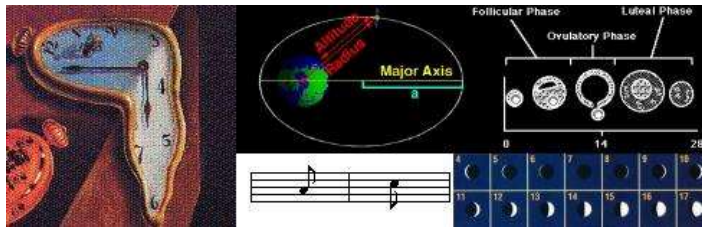
‘The smallest point must be considered a world in itself.’

Leibniz, on the fundamental particle of existence, the fractal space-time point.

Introduction: System sciences, the 4th paradigm of science.

1. Mathematical and Logic Languages. The syntax of Algebras and equations.
2. Geometry: Non-Euclidean Postulates.
3. 1st Postulate: Points with Parts: The 3 Fractal Topologies of Super-organisms.
4. 5th Postulate: i-logic Points of View.
5. 2nd Postulate: Waves of Energy and Information.
6. 3rd Postulate: Self-similarity.
7. 4th Postulate: Planes of Existence.
8. Organic, Social Classes.
9. Knots of Times: Synchronicity.
10. Palingenesis: Travel between Space-Time Planes.

INTRODUCTION: A NEW SCIENTIFIC PARADIGM



Time is cyclical and multiple; each event has a frequency that carries form, information and defines a cycle or closed trajectory, which breaks space into an inner, 'fractal' region and an external world. The result is the creation of multiple, 'vital' spaces and clock-cycles. The age of metric science measured all those space-time cycles by equalizing them with the rhythms of a single clock, putting them together into a continuum space-time graph. This age adopted a philosophy of science based in the new machines used to measure those cycles (clocks and telescopes, today evolved into computers and cameras), called mechanism, from Kepler, who said 'God is a clocker' to Einstein who affirmed 'Time is what a clock measures'. But as we measure more cycles and perceived more forms of space, a new paradigm is needed to account for that variety of 'multiple spaces and times'. Such fractal theory of spaces and times introduces the discoveries of the complex sciences of systems and information. Its main thesis is the existence of multiple cycles of spacetime, which are divided in energetic and informative cycles. They form together 'complementary systems', from particles of information and fields of energy (quantum physics) to reproductive bodies and heads of information (biological systems). This duality of time clocks is backed by a more complex philosophy of reality - organicism – since we found that all systems made

of energy and information show organic behavior, including machines, today evolving into robots that merge their energetic and informative systems. Organicism and its mathematical units, fractal points, that gather into social networks called topological spaces substitute the restricted concepts of Euclidean points and continuous spacetimes, explaining why all those cycles exist: Since we can reduce all forms and systems of reality to the only 3 topologies of a 4-dimensional universe: the energetic plane, the informative hyperbole and the cyclical toroid that combines energy and information in reproductive events. Thus self-similar, simple topologies of energy and information create complementary systems, which evolve further into organic systems, made of reproductive, energetic and informative networks. Thus we classify all space forms and time events in 3 topologies that put together in social networks, create organic systems guided by 4 time arrows: energy feeding, information gauging, reproduction and social evolution. Those 4 categories are the so-called drives of living beings. Thus, there is a 'Universal Plan' with an existential finality: to create organic systems, departing from energy bites and information bytes evolved 1st into social networks, then into complementary systems and finally into organisms: particles become atoms that become molecules that become cells, organisms, planets, galaxies and Universes. It is the 4th organic why that completes the adventure of science and this work explores in all its consequences.

1. The evolution of knowledge. The 4th organic paradigm.

A simplex explanation of this work considers the meaning of knowledge and what questions it must answer to exhaust the study of a subject. In journalism we ask what, who, how, when and why. In the evolution of science we observed a

what (experience) and then asked who. It was the mythic age of science, the first paradigm of knowledge – when an anthropomorphic being, often a god was the cause of all events.

Then the Greeks used reason to ask the how of things, its causes and consequences. It was the 2nd paradigm of knowledge: logic thought.

The 3rd paradigm came with the arrival of machines that measured time and space, telescopes and clocks which answered ‘when’. It was the birth of metric geometries when clocks equalized all the cycles of time of the Universe, by comparing them with the rhythm of a mechanical clock and put together all the fractal spaces of reality in a single, abstract Cartesian continuum whose lineal time and space coordinates allowed to plot the data collected with machines, finding certain regularities in the forms and cyclical rhythms of species, which were formalized by the laws of science. The culmination of this process came with General Relativity, which refined the measures of the cyclical trajectories of particles in the quantum, microscopic world and the cosmological realm by adding the deformations of those rhythms of time and distances of space produced by the limits of speed of our light-Universe.

And yet when all was done and measured it was still needed to respond to the why of those forms of space and rhythms of time. The answer to those whys is the 4th paradigm of science.

And they can be resumed in two words: vital spaces and time cycles and a new philosophy of reality, fractal organicism. They will substitute and absorb– according to the Principle of Correspondence that makes each paradigm a

particular case of the new, wider view - the limited concepts of a single space-time continuum and a mechanist description of the Universe.

The 4th paradigm was founded at the death of Einstein in the Macys congress 50 years ago, with the name of system sciences or complexity under a new principle of philosophy of science that was meant to substitute mechanism, called organicism, as it was understood that all what existed was a system or network of self-similar beings and those networks were the principle that structured all organic systems. It also added a 2nd arrow of time or ‘primary substance’ in the study of the Universe – information, which being fractal, discontinuous and non-derivable had not been properly mathematized in the previous paradigm

The mathematical difficulties to formalize information beyond its one-dimensional analysis by Shannon lasted till the discovery of fractal mathematics by Mandelbrot and the completion of Non-Euclidean mathematics by this author, with its definition of a fractal point ‘with parts’, the self-similar unit of all networks of the Universe, delayed a proper formalism for system sciences and complexity till the 90s, when I presented a summary of this work at the 50th anniversary of the International Systems Sciences Society. In the following years I gave a series of lectures as chair of Duality in the annual congresses of the International Systems Sciences society, which are the basis of this work.

Thus the basic unit of the new paradigm is also mathematical – the point – but a very special point, a fractal point which grows in detail and information the closer we come to it, till it becomes, as Leibniz put it, a world in itself. It is in fact a Non-Euclidean point through which infinite flows of energy and information can cross. The universe is

made of networks of such points, and each network is what we call a world. Consider humans as such points, in which each head is indeed a spherical point that communicates constantly energy and information with its own body and the external Universe. Such complementary points are made of two networks, one of energy and one of information, which we call roughly the body and head of the Points.

And it turns out that those complementary systems are everywhere in the Universe – they are the beginning of it all:

In quantum physics, they explain the complementarity principle: all particles of information are associated to a field of energy.

In biology they explain the duality of cell body/DNA informative nucleus, or body/head that all biological systems have to exist.

In sociology they explain duality of the informative classes that create the languages of information that rule societies, money, and verbal laws and the people who earn money and obey it.

In economics they explain the duality of machines of energy and information.

All in the Universe are thus complementary systems made of networks of non-Euclidean points. Now this might sound void to the reader, and an insult to the anthropomorphic readers that think humans are the most important points of the Universe, but it turns out that the laws those points obey in their actions and communicative flows are self-similar for any network: humans and electrons behave the same when they move through slits or in herds, the geometries of social groups are also the same and the ultimate purpose of those points, to feed on energy and information, whatever kind, is

also the same in all networks of the Universe. And so that group of laws of networks becomes a primary why for all beings of the Universe.

Further on, dual networks tend to evolve and reproduce new points through exchanges of energy and information.

The result is the creation of 3rd network/system: the reproductive network.

And so most systems of the Universe are organic, ternary systems made of Non-Euclidean points (which can be anything from atoms to cells to human heads) organized in 3 networks.

A human being, for example is a system made of 3 physiological networks: the energetic, digestive network; the reproductive blood network and the informative nervous network, with outlets to the exterior called senses. Those 3 networks provide the cells, the Non-Euclidean points of biology, with energy, information and reproductive hormones. And the result is a human being, himself a non-Euclidean point of more complex networks – the economic, reproductive network; political, informative network and energetic, military network of another complex system, a nation or more properly called the Financial-Military-Industrial system.

A fact that leads us to the final element needed to understand the why of the Universe: ‘non-Euclidean points’ organize networks that become points of a higher scale, which reproduce and organize new networks; and so the Universe keep growing in fractal scales, from particles that organize networks and become atoms that organize networks and become molecules that organize networks and become cells, that become organisms, that become planetary societies and

planets and stars form gravitational networks that become galaxies, organized by dark matter into Universal networks.

And so the why of the Universe is very simply speaking a social, organic, reproductive why: the Universe reproduce information and organize forms socially into networks: From magnetic and electric fields, made of magnetic and electric constants that mix and reproduce a light wave to fundamental particles, quarks and electrons that absorb energy and reproduce new quarks and electrons, to energetic males and informative females that reproduce together, all in the Universe can be described with that simple scheme of things, which can be as detailed as needed to connect it with the 3rd paradigm of metric measure of those networks, its motions and forms.

All those systems, their mathematical and logical formalisms, the ternary plan of creation and evolution, they follow; their symmetries in time and space, its ternary topologies (since there are only 3 topologies in a 4-dimensional Universe, which correspond to energetic, planar networks; informative, hyperbolic ones and toroidal, reproductive systems) and the study of its Feed-back, generator equation, which formalizes them all with the tools of fractal, non-Euclidean geometry, form the 4th paradigm or why of science.

Yet the reader must be aware that such paradigm implies a completely new philosophy of man and the Universe, more proper of Eastern traditions than Western, anthropomorphic, self-centered thought. Organicism substitutes mechanism; duality of energy and information substitutes monism (a single arrow of entropy or energy), form becomes more important than motion, the social network more important than the individual and life a better model than the machine.

It also has deep implications for our praxis of science and policy, since on one side puts man again as the measure of all things – the more complex organism of information known to man – it also vindicates the importance of biological and social sciences over physical ones and it ushers a warning to mankind, which is obsessed by the technological evolution of machines, forgetting the need to evolve humanity at social level and to take care of the life ecosystem developing a sustainable economy. Since it turns out that machines – organisms of metal – follow their own path of evolution as an independent species, which we men merely assembly, following the laws of evolution of all organic systems. Hence, we are now building, after making energetic bodies of machines in the XIX c. and informative heads (chip-brains, mobile-ears and camera-eyes) in the XX century, organic, robotic machines in the XXI c., which are competing with us as a new species in labor and war fields and could easily displace us as the top predator species of this planet by the end of this century.

The 4th paradigm is thus not only a theoretical advance in our knowledge of the Universe but also as science has always been, a tool to improve the future of mankind, which faces in this century challenges originated by the 3rd paradigm and its worship of machines of measures, largely ignored by the cult to the machine the 3rd paradigm caused.

The content of this work, which tries to give an overview of the philosophical and mathematical foundations of the 4th paradigm and its application to the 3 main bodies of human sciences, physics, biology and sociology is divided accordingly in 5 lessons which I will give in the ISSS congresses of Tokyo, Madison and Waterloo. Together and in the order given they formalize the 4th paradigm as a

General Systems Theory of Multiple Spaces=Networks of Non-Euclidean Points built with 2 simplex Times arrows, energy and information and its complex combinations, reproduction, exi, and social evolution, $\sum exi$, which suffice to explain all the events and forms of the Universe:

Lesson 1: The Dualist Philosophy of General Systems Sciences.

In this lesson we shall explain the structure of the Universe made of self-similar networks of energy and information, which are the 2 components of all the complementary beings of the Universe that constantly evolve into more complex systems, creating reproductive networks and evolving socially into bigger wholes.

Lesson 2: Fractal Universes.

In this lesson we formalize the philosophy of General Systems Sciences with the advances of fractal and Non-Euclidean geometry. We first resolve the 5 postulates of Non-Euclidean geometry, which define all beings as 'points with parts', able to process energy and information; all lines as flows of energy and information between points; all planes as networks of n-points connected by energy and information flows and departing from those structures we deduce the mathematical laws that all complex systems made of multiple networks and extended through different scales of size, follow. We illustrate those laws with examples, and use this formalism in the following lessons to resolve and complete the metric models of physics, biology and economics, which now find their why in the structure of networks and systems, their 3 ages of evolution, its 3 basic topologies and the laws that all networks follow derived from the 5 postulates of i-logic geometry.

Lesson 3: Complex Physics, the arrow of Einstein.

Classic physics drags many errors derived from its definition of space as a continuum and time with a single arrow of entropy and energy. We introduce the model of duality with the arrows of energy and information and the model of multiple spaces, to define a complex Universe made of the interaction of 2 different membranes of space-time, the light-membrane and the gravitational membrane, and 2 arrows of time,, the arrow of entropy and electromagnetic energy and the 'arrow of einstein', of mass and gravitation, that attracts and in/forms the physical Universe.

Lesson 4: Duality in Biology. We study Biology and the evolution and differentiation of species in systems specialized in energy and information with the laws of Non-Euclidean Geometry and the two arrows of energy and information, its 'ages' in time and topologies in space, unveiling a guided plan of evolution that completes the work of Darwin and Mendel.

Lesson 5. The 72 years cycle of evolution of money and machines.

The application of duality and systems theory to economics unveils a biological model of evolution of machines of energy and information with a series of 72 years cycles of evolution of energy machines, information machines and now robots, with extraordinary consequences for the future of mankind. Since economics is a biological discipline, in as much as machines its main produce are systems that imitate our human organs of energy and information.

Lesson 6. Memetics: the superorganisms of history and economics. We complete the Introduction to a Dualist model of system sciences with the study of the 2 superorganisms

that are being created on planet Earth: The superorganism of human beings that we call history and its smaller super-organisms, (civilizations) and the FMI complex, the superorganisms of money, weapons and machines of metal, called the economy, which develop in a mutual process of symbiosis and competence.

Those 5 lessons which I hope to give in the different congresses of Systems sciences during the next years complete the model. If the reader is interested in the whole, even if we give the same brief introduction in all those lectures with the basis of the model, my advice is that he tries to read the lessons in the order they were given, as it will be difficult to understand the model without reading lesson 1 and 2, which explain the logic and mathematical foundations of the 4th paradigm.

Recap. The 1st paradigm of science responded what and who; the 2nd paradigm to the how; the 3rd paradigm to when, measuring space distances and time frequencies in great detail; the 4th paradigm responds to the why of the forms of space and cycles of time that all entities of the Universe follow. That why is organic, social: the Universe is made of complementary energetic and informative networks of 'Non-Euclidean points' that evolve and combine together, creating reproductive networks. And such complex systems create, new bigger, fractal networks units of a larger plane of space-time, evolving reality in scales of size that follow the same organic laws, from particles that become atoms that become molecules, cells, organisms, societies, planets, galaxies and Universes.

I. LOGIC AND MATHEMATICAL LANGUAGES.

1. The nature of mathematics and logic.

The first concepts and ideas of mankind tend to be simple, intuitive and truth. The forest is clear and the details of the trees do not hide the whole. So the oldest philosophy of the Universe, that of the Chinese agricultural Neolithic about a world made of yin=information and yang=energy, which combined to recreate the infinite 'waves of existences' (Ch'ang), is still the most accurate philosophy of reality, now forgotten with the arrival of so many scientific details that the overview of the forest is lost.

The same happens with the understanding of time, which all earlier civilizations considered cyclical and causal, synonymous of change; and so they study all different types of change, establishing repetitive rhythms of change and causal relationships, creating the science of Logic (Aristotle).

The Greeks also defined mathematics as the language of space and so Geometry became the foundational science of mathematics; and it remained so till the XVII century, to the point that Al-Jorizim, the founder of modern mathematics (Algebra and Algorithms are words derived from his names and books, translated by Middle Age Spanish mathematicians and then spread during the renaissance to Europe), proved all its quadratic theorems with geometrical methods.

It would be latter in the XIX and XX centuries (with the exception of the insights of Leibniz), thanks to the work of Frege, Boole, Riemann, Einstein, Poincare, Cantor, Bourbaki, Mandelbrot and Computers, which this work advances a step further, when Space and Time – hence Logic and Geometry – were first mixed, but without a full formalism that made possible to extract all the laws of spacetime and grasp in

depth the meaning of those languages.

This is what this work is set to achieve and in doing so, it will refound our understanding of those 2 languages.

Recap. Mathematics is the language of space; Logic is the language of time. Thus, the foundation of mathematics are the postulates of Geometry and the foundation of Logic the causal relationships between time arrows. We need to upgrade Geometry to describe a universe of multiple spaces and logic to describe a universe of Multiple Spaces-Times.

This is done by resolving the 5 non-Euclidean postulates of Geometry, which describe knots of time arrows as points, and by observing the self-similarity of mathematical equations, which describe groups of knots of time arrows as numbers and the equations of Multiple Spaces-Times derived of the Generator equation of the Universe or Principle of conservation of energy and information.

2. Duality of Geometry & Algebra: Numbers are forms

Mathematics was defined in XIX C. encyclopaedias as the science of sequential numbers (algebra) and static space (geometry). Till the XIX century, the science of sequential numbers or 'mathematics of time' used only Aristotelian Causality with its single time arrow to order them. On the other hand, the 'mathematics of space' considered only a lineal, continuum space defined by Euclid. Both sciences were fusioned by Descartes (analytic geometry) with his Cartesian Plane; and we can thereafter talk of mathematics of spacetime, albeit in its simplest conception: a single, static space, and a lineal, uncausal time.

In the XIX and XX century mathematicians developed theories of multiple spaces and defined spaces with motion (Klein), and spaces as networks of self-similar points (Riemann) but maintained 4 of the 5 postulates of Euclid, the

single Cartesian spacetime continuum and a single causal arrow of lineal time in its theory of numbers. Thus a theory of multiple space-time arrows requires the evolution of the science of space (geometry), completing the 5 postulates of Non-Euclidean Geometry and also the evolution of the science of temporal, sequential numbers, expanding its laws of causality. This was partially done with the use of the Complex Plane, since real numbers roughly correspond to the properties of continuous energy and complex numbers to the property of discontinuous, informative time. But its dual nature as an expression of the different properties of space and time has never been fully understood even if Physicists use the Complex plane in modern physics.

In that regard there are two possible representations in a plane of complex, informative numbers:

- They could be placed in the inverse, negative side of the graph of Cartesian coordinates as the arrow of information - to better represent the duality of energy and form ($I \leftrightarrow E$). Then many results obtained with complex numbers become intuitive, as it is the case of the metric of Special relativity, where the time factor has a negative side - c^2t^2 meaning indeed that time-information contract space and 'rests' to the positive arrow of Einstein's equations.

- Or they can be placed, as it is customary in the perpendicular Y dimension. Since a dimension of a mathematical plane becomes a sequential order of numbers, then the Complex plane becomes a bidimensional mathematical representation of the 2 simplex arrows of time, energy and form.

Further on, a 3 dimensional complex plane represents 3 time arrows where $exi=z$ represents the reproductive arrow.

Finally a fractal, multiple space-time built with a series of complex planes (a task started by Riemann with his description of polynomials as a series of planes of space, stacked one after another), is the appropriate form of defining the 4th arrow of time. Because the mathematical model of those 4 arrows combined is beyond this introductory course, we shall consider only briefly some aspects of the Algebra of time and define in more detail the improvements on the non-Euclidean geometry of space brought about by the understanding of Multiple Spaces-Times.

All those expansions of mathematics accomplished by Multiple Spaces-Times theorists (I, me and myself :-)) as the science of multiple sequential time (algebra of Multiple Spaces-Times) and multiple, fractal spaces (geometry of Multiple Spaces-Times) improves the accuracy of mathematics as an image of the reality of multiple space-times and explains its ultimate meaning, as the science of space (geometry) and time (numbers).

Yet from a philosophical perspective what the conjunction of mathematical/spatial languages and logical/temporal ones means should become obvious as we advance in its development: *space is mathematical, geometrical; time is logical, sequential, numerical and the conjunction of both is organic; reason why complexity and system sciences, who observe the Universe from an organic perspective are the sciences of sciences.*

Recap: Geometry is the science of spatial form; Algebra of numbers is the science of temporal events. Its combination and evolution into a model of multiple sequential dimensions of numbers and multiple planes of space becomes the science of reality, of organic systems.

3. Algebra: Numbers and equations

To do so the reader should just consider two aspects of the Algebra of numbers, its meaning as isolate entities and the meaning of equations of numbers.

Numbers in this new outlook are not only intervals of a one-dimensional straight line, but as Plato put it, forms, since they determine different relationships between those points of view, mediated by time arrows (whose final outcome will depend on which type of arrow communicate them; so for example, 1+(feeding)1=1, but 1+(reproduction)1=3.

Mathematics is concerned with 2 seemingly different worlds, the geometry of spaces and the logic of numbers. To fusion both requires to understand numbers as forms. A number is not only an abstract set but always a collection of self-similar beings extended over a common vital space, a network. And so networks create complex forms, topologies of space-time, as the motions between points of the networks become stable exchanges of energy and information between two polar points. Yet since each number is a geometrical form no longer limited to the simplest one dimensional form but can vary its geometry and hence its function, degrees of freedom and complexity as we increase its 'number'.

Thus the 4th postulate shows how points, numbers, the self-similar class of equal forms create geometries:

The line is simple. The line joins two points and can only have a combination.

The triangle can only have a closed combination, but 3 possible open combinations, Ab, Ac, Bc.

The quadrangle is more complex. It can be joined in 2 combinations, as a cross and a square. And it can be left as an open snake with 3 different orientations. So a foursome acquires a snake shape to move with the arrow of energy; a

crossed form to perceive in its center ‘5th point’ and a square shape to accumulate and reproduce its internal organs; and so each shape of the same number becomes a topology with a different form and function.

In that regard, a complex analysis of the simplest numbers shows that the more perfect form is the 10-cellular system or tetrarkys, in which 3 x 3 triangular corners act as organs of energy, information and reproduction with a 10th central element that communicates all others and acts as the one of the higher scale, representing the entire organism.

Thus as the number of cells grows, the topology of the system will grow in degrees of freedom and complexity till resembling more and more the repetitive, geometrical forms of social organisms. Topologies become thus at the end, complex networks, adapted to different functions of complex organisms.

As abstract as all this might seem, when observing nature we shall see how those type of events, waves and social planes happen in all the scales of the Universe, from atoms which form crystal networks based in the equality of the same atoms or at best in the existence of a ‘body-mass’ of equal atoms intersected by a few ‘stronger’ atoms that form a complementary network of higher resistance, to the body rejection of cells with different DNA.

Recap. All the structures of mathematics, regarding of the notation we use, reflect events and forms of knots of time arrows (st-points or numbers), as mathematics is a language whose grammar derives from the Universal grammar of spacetime.

4. Probabilities and combinations

One of the less exploited branches of mathematics, combinatory, is important in multiple time-spaces since we

find always complementary systems of reproductive energy and information, each one with a ternary choice of evolving differentiation (energetic, informative and balanced species). So especially in the classification of species of different sciences we shall find simple combinatory laws that explains the differentiation in 3, 6, 8 and 10 elements depending on the triads and dualities of multiple spacetime systems. Regarding probabilities in time, whose symmetry are percentages of populations in space (confused in some cases, as in electronic nebulae, obvious populations of fractal electrons in space studied as time probabilities), again it is an essential tool to study the proportions, herds, groups and networks of self-similar st-points.

Recap. Probabilities study causal events in time and populations in space; combinatory studies the differentiations of species according to the variations of bodies and heads.

5. The syntax of equations

We shall therefore concentrate in the study first of the geometrical foundations of mathematics, expanding them by completing the Non-Euclidean r=evolution started by Riemann and applied to Physics by Einstein, by fusioning the concept of a Non-Euclidean Point (Riemann, Lobachevski) and a Fractal Point (Mandelbrot, myself), defining in this manner the fundamental unit of mathematics, the ‘point’ (Geometry) or number or set of points (Algebra).

By doing so, we shall realize that indeed, Logic and Mathematics, Time and Space, Motion and Form, are unavoidably joined, as the 2 sides of the same coin. Since the new postulates of i-logic, Non-Euclidean geometry (the geometry of multiple spaces and the logic of multiple, causal arrows of time), are both logic and geometric postulates.

Yet since Non-Euclidean points are merely knots of time arrows, we shall prove that all what Geometry and Logic does is to reflect with a synoptic language that can ‘fit’ inside the human mind, the events, forms and relationships established in the real Universe between those knots.

On the other hand, Algebra, is a sequential, synoptic language of time used to operate with complex groups of points/numbers, either expressed with the modern concept of Set theory (Cantor) or the old concept of Equations and Operandi, will be shown to be in all its $F(x)=G(y)$ relationships a reflection of the permitted operations Generated by the Feed-back equation, $E \Leftrightarrow I$, or Generator equation of space-time that expresses the foundational law of physics: ‘energy and information never die but transform into each other ‘ad eternal’. And all those possible transformations are indeed, what mathematical operations done with equations of the form $F(x=e) \Leftrightarrow G(y=i)$ describe.

Further on, in Algebra and all its branches, numbers are the units used in equations, all of which follow a rather simple ternary structure: $f(y) = f(x)$, which we shall write as $F(i) \Leftrightarrow F(e)$; that is, all equations are descriptions of certain events, which can be described also with the wider syntax of all languages ‘generated’ by the Universal Grammar of the feedback equation of space time. The corrections are minimal but relevant. Equality, = now becomes dynamic, \Leftrightarrow , since many errors in science are derived by the fact that scientists tend to think that an equation is based in equality (3rd Euclidean postulate) and not in self-similarity (3rd non-Euclidean postulate). So for example: $E=mc^2$ is not an equality, Mass is not energy, but a self-similarity in which at least one property of Energy is transformed by the symbol of

self-similarity, \Leftrightarrow , in this case lineal energy coils into cyclical information, mass.

Many errors of science are caused by the ‘mechanical’ approach, which operates with mathematics without understanding the deep meaning of those mathematical equations. In essence any equation, $F(Y)=F(x)$ can be reduced to a transformation or relationship between 2 functions that represent complex and simplex knots of time arrows or events between them that become transformed through an operandi, which represents one of those basic transformations. So we could write instead as the Universal Grammar of all algebraic equations, either the Generator equation of space-times or any other notation that reflects the fact that equations describe events and forms born of transformations between structures of time arrows. For example if we write:

$$F(\uparrow, \rightarrow, \perp)^{i\pm n} \Leftrightarrow F(\uparrow, \rightarrow, \perp)^{i\pm n}$$

We describe all possible equations in the ‘dimensional notation’ of time arrows, where \uparrow is the Time arrow of information, \rightarrow is the time arrow of energy, \perp is the time arrow of reproduction and $^{i\pm n}$ is the transcendental arrow of social evolution or emergence and social devolution or death.

Recap. Algebra is the science of sequential numbers; hence the mathematical representation of time events. Its equations reflect those time events as a language whose syntax is self-similar to that of the Generator equation of time events, once we substitute the concept of static equality, =, for the concept of dynamic self-similarity \Leftrightarrow formalized by the 3rd non Euclidean Postulate.

6. Classic algebra. The meaning of its operandi.

The basic concept of algebra is that of number, briefly explained in this text and that of operations between numbers

which are herds of time knots and its properties and the structures they create (grupoids, semi groups, groups, Boolean Algebras and rings). All those operations describe in fact the possible events that take place between points that create either a herd/simplex plane of existence, or a complementary organism extended in 3 relative planes, $st+1$ (informative system), i (reproductive, reproductive body) and $st-1$ (ecosystem in which the herd or organism absorbs its pixels of information and bytes of energy). The meanings of the basic operandi are:

- **Sum**, $+$, Σ is the fundamental operation that creates ‘body herds’, in which the individual cells are simply connected (each one relating only to the cells that surround it) and so their ‘exi’ existential force merely adds up. Their reciprocal, destructive event is subtraction, $-$, when 2 herds enter into a Darwinian event and one herd extinguishes the other.

- **Multiplication**, \times , Π , is the key operation that creates ‘informative networks’, in which the individual ‘neurons’ are complex connected, each one, joined through its ‘axons’ or ‘subsets’, to all other neurons (ideal network) and so their ‘exi’ existential force multiplies them. Thus for example, 5 neurons with a complex connection, each one will have 5 axons/subsets, and the number of connections will be 25.

The duality of planes of space-time, proper of informative systems is the first ‘complex’ structure extending beyond a single space-time continuum used to define energy-only processes (and hence deforming the understanding that physicists have of information systems, which cannot fit in a single plane and their obsession for models with a single arrow of energy/entropy). Essentially an information network can ‘operate’ both in the language of the energy herd it controls (so quarks, which are bidimensional vortex of mass-

information, operate with electromagnetic forces to control electrons); yet they also operate as a network through the other plane of existence unknown to the herd.

This is expressed in mathematics with 2 concepts: energy herds are ‘groups’ defined by a single operandi and information systems are ‘rings’ which operate with 2 operandi. And ‘Groups’ and ‘rings’ are the 2 fundamental structures of algebra to the point that a ‘ring’ is called simply an algebra.

An important law of complementary systems of reproductive energy and information is given by the fact that the maximal product is always that between ‘self-similar subsets’, such as if we have 2 st -points with a total of 10 $st-1$ elements, axons or subsets, the maximal number of connections/products, will happen when $E_{st-1}=I_{st-1}$ ($5=5$, $5+5=10$): $1 \times 9 < 2 \times 8 < 3 \times 7 < 4 \times 6 < 5 \times 5 = 25$.

It means that in the product exi that defines the existential force or momentum of a complementary system, those systems, which are balanced, are the most efficient.

Thus, the most efficient systems are those in which the 2 complementary parts are in balance between body and brain; a law fundamental to explain the survival of balanced organisms in its ‘2nd age’ when $E=I$; which is also the definition of *beauty*, as the classic age of balance between energy and form.

This laws explains why the fundamental algebraic operations are quadratic equations, as $X= E \times I_{i=e}$ is simplified with a square, x^2 and defines multiple energy/information systems.

Yet more complex equations of the type x^n normally respond to operations between different planes of existence, also described with Riemann's complex planes.

- *Division*, which describes the inverse operation of finding the number of sets departing from its parts/subsets or network connections, but also another fundamental operation - the ratio between spatial energy and temporal information, origin of multiple Universal constants, E/I or $I/E = K$, related to our previous concept of balances between energy and information that sets the survival limits of any given system.

- *Integration and derivation*. Those 2 'recent' operations are related to complex operations between systems that extend in 2 or n planes of existence, especially in 'neuronal networks', whose cells/subsets 'emerge' into units of a higher plane. Because of the complexity of this 'summit' of Multiple Spaces-Times, we won't consider them in this introductory work.

Thus, we can consider the main operations of algebra to respond to the basic processes between time arrows.

Recap. The operations of algebra respond to the fundamental events between knots of time, tied by their time arrows.

7. The 'structure' of Mathematical languages.

The Nature of mathematics as a language of space-time (geometry and numbers) can also be expressed with the modern conception of mathematics, based in the work of Cantor (theory of sets) and Boole (Computer Algebra), which was summarized by the Collective Bourbaki, whose 'Mathematical elements' reduce all mathematical disciplines, to 3 structures, themselves reduced to set theory:

- *Structures of Order*, understood as structures, which

describe the hierarchical order $<, >$ of numbers, which we just described as social, geometrical groups. Thus, those structures are mere reflections of the 4th arrow of eusocial 'love' that creates social groups.

- *Topological Structures*. They describe the basic forms of the Universe, which in a 4 dimensional reality are only 3: the hyperbolic, informative geometry; the cyclical, reproductive toroid and the spherical, external, energetic membrane, defining all relative worlds/species as complementary systems of reproductive energy and information. We shall show this simple ternary, topological structures, which are the basis of all forms of reality in our analysis of the 5 non-Euclidean postulates. To mention that topology is in fact the ultimate science of space from where we can derive all the other spatial structures, as geometry was the basis of classic mathematics in its Greek inception. In fact topology and set theory are quite similar in its laws. What topology adds to geometry is 'motion' and 'relativity'; thus including the Galilean paradox in the structure of mathematics, since two topological structures are equal regardless of the 'distance/size/motion' of its surfaces.

- And *Algebraic structures*, which study the complex arrows of Time born of the 'operations' between simplex arrows and are ultimately expressions of the Generator equation of space-time, $E \leftrightarrow I$, in as much as all algebraic equations are of the type $F(x)=G(y)$, which is just a particular case of the Universal syntax/grammar of reality of the Generator feed-back equation.

Thus, there is a direct relationship between the 3 fields that define all mathematical structures and the Temporal, Spatial and Combined (algebraic) operations between time arrows, which simply means that mathematics has always been the

human language that describes the ultimate reality: Discontinuous Spaces (topology) and Relational Times (causality); and the complex interrelationships between them (Algebra). While the 2 first facts (the identity between space and topology and Time and causal order) are intuitive, we might conclude this overview of the meaning of mathematics, with a brief introduction to the meaning of Cantor's sets, and Boolean Algebras used for Mathematical computing, as an expression of all Mathematical Structures and a formalism of Multiple Spaces-Times. We shall by doing show, prove, that all mathematical structures are explanations of properties of the ultimate reality: the timespace defined by the 4 arrows of the Universe and all its species.

Recap. Mathematics can be reduced to 3 types of structures: topological/spatial structures, structures of causal, temporal order; and algebraic structures that define the outcome of complex relationships between Multiple Spaces Times. Thus i-logic mathematics is the synoptic language the human mind uses to describe all what exists: a Universe of spatial energy and temporal information.

8. Mathematical evolution: from Geometry to Sets

We said that all what exist is a system, made of knots of time arrows=st-points. In its most simple formalism, humans perceived those knots as numbers (sets of self-similar points) and those numbers became points of a geometrical plane. Next, Descartes reduced geometry to Analytic Algebra, showing that there were two self-similar languages to express operations between points, Geometry and Algebra, whereas Geometry was mainly concerned with the spatial description of networks of numbers and Algebra with the Causal relationships of those numbers. So we could say that Geometry and Algebra were, according to the Duality of the

Galilean paradox, two sides of the same coin: a spatial and temporal description of the reality of st-points. We have till here focused in the evolution of the Geometrical perspective, by completing Non-Euclidean Geometry, reducing Topology to a description of the 3 parts of Non-Euclidean Points, by understanding those points as Fractal points in a Universe of multiple space-time scales.

We briefly considered how the properties of a network-space (a web of points), are those described by Lobachevski and Riemann, which depend in the self-similarity (homogeneity) and adjacency (closeness) between those points, (formalized latter in this work by the 3rd Postulate of non-Euclidean geometry.)

We have also studied the complex causality and order between the arrows of time, which are the foundations of the structures of order in mathematics (but go beyond the present mathematical corpus).

Let us then consider the 3rd fundamental type of structures, Algebra and the fusion of them all in set theory.

Recap: humans, following the principle of Correspondence have gifted the mathematical formalism of an increasing complexity and richness in its description of the properties of spacetime arrows, from the simplest concept of a number/point without parts, to the complex analysis of Non-Euclidean Geometry and Theory of sets.

9. Cantor sets. The paradox of discontinuous infinites

All those properties and many other structures of mathematics were further reduced by Cantor to the ultimate reality of all mathematical structures: the theory of sets, composed of subsets, which we affirm is the natural formalism of system sciences, as a theory of 'super-organisms' composed of smaller super-organisms, which are

sets of self-similar subsets; whereas the theory of sets and subsets gives the previous, simplified theory of numbers (each one a class or set of self-similar points), an inner content, as i-logic geometry gives points its inner parts.

How this ‘formalism that mirrors reality’ called set theory, from where all mathematical structures can be deduced, reflects the Nature of Complementary systems made of energy and information and its properties? The answer should be self-evident to those kin readers who grasped the inverse properties of energy and information:

Set theory defines reality in terms of two inverse elements A (points of energy) and A', (its complementary, inverse element). Thus set theory is no more no less than the analysis of the 2 simplex arrows of existence, energy and information and its complementary organisms.

It is thus not surprising that in set theory energy and information, A and A' are called complementary sets and the fundamental law is called the Law of Duality (Morgan Laws), which basically tells us that we can reduce all sets to operations between A and its Complementary, as we can reduce all systems to complementary Energetic and informative organisms, which are the whole.

So the main operations of sets reflect the properties of Complementary systems of reproductive energy and information, where A=Energy system; B=Information system; W= Relative Universe (World, Whole or Superorganism):

$$- E \cup I = W; I' = E; E' = I; E \cup E' = W; I \cup I' = W.$$

Thus, the Union=Fusion of an energetic and informative, complementary system creates a whole superorganism.

This same equation expresses in the language of Cantor sets an act of creation of a mapping of the Universe, whereas I, the preceptor observes I', the Universe and the result is I U I' a whole mapping of reality within the mind of the preceptor.

$$- E \cap I = \emptyset; E \cap E' = \emptyset; I \cap I' = \emptyset.$$

It describes anti-events, which annihilate the form of particles and antiparticles, waves and anti-waves and so in Multiple Spaces-Times is equivalent to the anti-event: *Past x future = present.*

$$- (E')' = E, (I')' = I$$

It describes two events of the feedback, generator equation: $E \leftrightarrow I, E \Rightarrow I, I \Rightarrow E$, hence it describes among other events a whole cycle of life and death, where $E \Rightarrow I$ is the arrow of life and $I \Rightarrow E$ is the arrow of death. This ‘property of sets’ called an involution is called in Time Arrow theory a Revolution of times, sum of an Evolution ($E \rightarrow I$) and a Devolution ($I \rightarrow E$), and is the fundamental event of all realities.

Since energy and information have indeed inverse properties. And so we can state a Cantor Set describes the properties of complementary systems of knots of Energy and Information.

$$- E \cup I = E + I - E \cap I.$$

It shows the efficiency of systems that eliminate redundant elements, from genetic ‘fusions’ to Darwinian events.

Further on, when we understand Intersection as an Event of ‘Darwinian perpendicularity’ between a complementary system of Energy and Information, $E \cup I$, and an external entity, C, which the organism uses to absorb ‘informative

pixels' or 'energetic bytes' for its mind or body (an event of perception or feeding), we obtain the obvious result:

$$(E \cup I) \cap C = (E \cap C) \cup (I \cap C).$$

Thus the complementary system takes only the part of 'C', which it needs to inform itself (self-similar to I) or to feed itself (self-similar to E), discharging the rest. And indeed, we perceive only information self-similar to us, or energy 'bricks', self-similar to our bricks, which we can use, to construct our energetic, body cells (subsets of E). And so on.

We mentioned that cells are subsets of I or E. Indeed, the second element of set theory studies the relationship between Sets (wholes) and its parts (subsets), and so it is simply the description of the properties of parts that become wholes.

An interesting result of those properties are the so-called Paradoxes of Set Theory, according to which there are certain contradictory sets that do not exist, most of them related to the concept of Infinite, which Cantor also studied, finding multiple contradictions. What this means, plainly speaking is that infinity and continuity do not exist, in as much as all Planes of existence are discontinuous with a certain limit that defines a Universe of networks of points with limits given by the number of networks, the dark spaces between them and the existence of upper and lower limits of energy and information in the existence of those points (universal constants), beyond which we must transcend and emerge, or descend and dissolve into other membrane of space-time with different properties.

To mention also that Gödel's theory of incompleteness was based in set theory and showed indeed that mathematics, while being the most complete description of the spatial events of reality was neither the ultimate language of the

Universe (as Frege and Boole proved it could be reduced to Logic propositions) but also an incomplete language, which did not describe all realities and an inflationary language, which described systems that do not exist in reality. Those are indeed, two properties of all languages of information; that both distort reality, as the paradox of Galileo prove, and do not include all reality, given the discontinuity of the Universe; which lead us to the concept of Dark Spaces, the true meaning of the 'complementary Universe' that completes the world we see.

Recap. Set theory is the basis of most structures of mathematics, in as much as it defines all the events between complementary systems of reproductive energy and information and its limits.

10. Boolean Algebras

Set theory is also the basis of Boolean Algebras, which are the basis of the Computer Mind, which is able to describe reality (albeit in a simplified manner), with the use of such algebra. In that regard 'Euclidean geometry' and 'Aristotelian Logic', which is what Computers think can be reduced to the Simplex properties of Energy and Information systems and so the 3 fundamental Boolean Algebra based in set theory are:

- The previously described Algebra of sets and its two fundamental operations, \cup and \cap .
- Aristotelian Logic with its 3 fundamental operations of conjunction (\wedge), disjunction (\vee) and negation (\neg)
- Its implementation in *fractal networks of logic circuitry by computers that represent the reality of all energy/information systems of the Universe.*

Those 3 basic Boolean Algebras are the spatial, geometric (set theory), logic, temporal (Aristotelian causality) duality of the Universe and its exi, reproductive combination.

Recap. Computers represent the Universe with two complementary arrows of energy and information, using set theory.

11. Reproductive arrow: Vectors & tensors of existence.

Set theory defines operations between the 2 simplex time arrows. What are then the mathematical instruments to explain the complex arrows of reproduction and eusocial evolution? Reproduction is explained with vectors and tensors. Indeed, since the postulates of i-logic geometry define knots and topological planes as complex operations between Time Arrows in 3 dimensions, these can be considered mathematical vectors. And indeed, the mathematical formalisms of those time arrows, when in dynamic relationship are the operations of vectors and tensors: Time Arrows form a vectorial space, which has 3 dimensions corresponding to the Time Arrows of energy, information and its product, reproduction. Thus the function of reproduction, *exi*, between a 'long, energetic X-dimensional arrow' and a 'tall, informative Y-dimensional arrow', gives us a 3rd Z-dimension, *exi* – a reproductive arrow. So when we multiply 2 vectors, the 3rd vector, vectorial product of the other 2, is a perpendicular Z-vector.

However the plane that better represents the structure of space-time geometries is the complex plane, as imaginary numbers share most of the properties of information, albeit with certain corrections, whose complex formalisms goes beyond the scope of this introductory course.

The vectorial space of time arrows is specially clear when those arrows happen in an homogenous physical 3-dimensional space (astrophysics), and explains the laws of electromagnetism, which as we shall see is a perfect Euclidean space, given the fact that we live in a light membrane, in which light, the ultimate substrata of reality

has a flat, magnetic, energetic field, perpendicular to its electric, informative field, perpendicular to its reproductive speed. So the laws of electromagnetism follow the geometry of vectorial arrows, 'the rule of the hand' and the Maxwell Screw that defines the geometry of interactions between electric and magnetic fields.

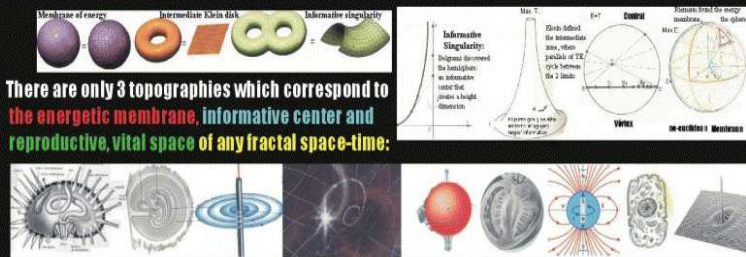
And the 4th arrow of time, eusocial evolution - which kind of mathematical operation describes it? Since it is the most complex of all time arrows, we cannot describe it properly here, with the limited elements of Time Algebra, we have introduced. Yet in the next paragraphs, we shall do it, as we analyse the geometrical perspective of time arrows in depth.

Recap. The operations between Time Arrows upgrade the abstract laws of mathematics, creating a general, vital geometry of the Universe, which can be applied to all planes of existence. Numbers become then topological networks of knots of time arrows; vectorial spaces define operations between those time arrows; and theory of groups, rings and other types of spaces become structures whose laws can be derived of the general laws of Multiple Spaces-Times.

II. NON-EUCLIDEAN POSTULATES

ORGANISMS ARE FRACTAL POINTS WITH 3 INNER DIMENSIONAL NETWORKS=PLANES

ORGANISMS ARE NON-E POINTS, MADE OF 3 FINITE, QUANTIC DIMENSIONAL PLANES= NETWORKS OF ENERGY, REPRODUCTION AND INFORMATION COMMUNICATED THROUGH WHITE =ENERGY & BLACK =INFORMATION HOLES=FLOWS WITH THE EXTERNAL I+1 WORLD

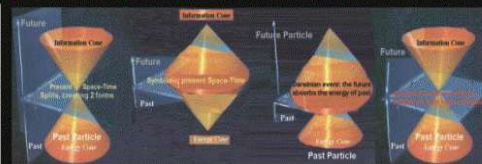
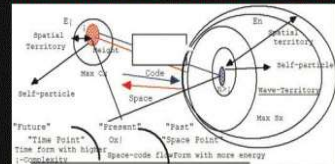


There are only 3 topographies which correspond to the energetic membrane, informative center and reproductive, vital space of any fractal space-time:

WHO ENACT IN TIME THE 3+1 EVENTS DESCRIBED BY THE 5 POSTULATES OF I-LOGIC, FRACTAL GEOMETRY:

1. POINTS WITH PARTS. 2. LINEAL ET WAVES-FLOWS

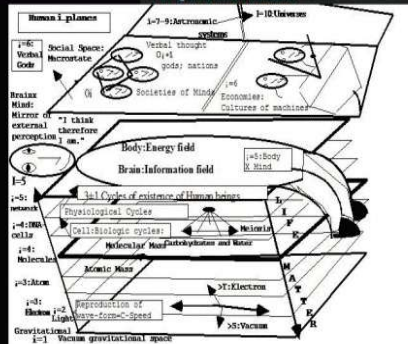
3: EQUALITY VS PERPENDICULARITY



Quantic Points have inner dimensions. They share dual lines-flows of energy & information with other points, creating quantic, organic networks=planes of space-time:

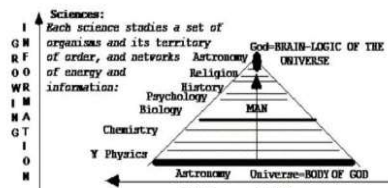
Perpendicular exT flows create destructive & hierarchical events. Parallel flows built social networks. The combination of both, create the complex i-dimensional structure of superorganisms:

4: QUANTIC PLANES



5: I-VOLUTION

Quantic Networks joint Non-E points through dual flows of energy & information into present, existential planes. Planes organize a 5th hierarchical i-dimension through unequal flows of energy from past micro to macrocosms & information from future macrocosms to microcosms:



12. The 5 Postulates of Non-Euclidean, i-logic Geometry.

According to the Correspondence Principle¹ a new scientific Theory has to include all previous ones. So happens with Multiple Timespace Theory, which includes as specific cases all other simpler geometries of space-times, by completing the 5 Non-Euclidean postulate of geometry and adding the concept of a fractal point developed in XX C. fractal geometry. The result is a geometry that includes all other geometries; since the incomplete non-Euclidean geometry discovered in the XIX c. (5th postulate: a point can include many parallels) already included the previous Euclidean postulates based in points through which only one parallel can be traced. Those new postulates describe with more accuracy all type of space-times belonging to all kind of sciences, from the physical space/time of atoms (described by quantum Physics) to that of galaxies (which Einstein described in his General Theory, using the 5th Non-E postulate); from the organic space/time of cells and species to the historic space-times of nations.

Thus, according to the Correspondence Principle, we establish a hierarchy of completeness among all those geometries that stretches from the simplest Euclidean Postulates to the i-logic geometry of fractal space-time, which includes all others as particular cases; and it is in itself a partial image of the total information about space-time we call reality - always bigger than any 'linguistic' image we made of it with the languages of the mind that reduce the total information of reality to fit it in the brain:

Euclidean Mathematics (Light- Space) > Classic Non-Euclidean geometry > (Gravitational Plane) > Fractal space-times (all scales) > Total Reality

We thus consider Euclidean geometry, the natural geometry of a single, continuous space-time, made by the 'eye' only perception of light-space and its 3 perpendicular dimensions (height/electric field, width/ magnetic field, and length/c-speed). But that space is not all the spaces of reality. It misses at least a second fractal scale, gravitational scale and *all the complex, vital spaces of organisms of information and matter*. In Non-Euclidean mathematics, the new unit of 'fractal space-time' is the 3-dimensional Fractal Point of view, whose main property is to have in/form/ation - an inner content, which in a Universe made of multiple scales of size, we perceive as we come closer to the point and observe it in detail. Those fractal points with volume are described by the 5 Postulates of Non-Euclidean Geometry, which adapt to fractal, discontinuous space and cyclical time, the classic 5 Euclidean postulates of geometry. This more evolved Fractal, i-logic Geometry of space/times includes all previous geometries as simplified cases of the more complex structure of the Universe in multiple scales. We call it a fractal, i-logic Geometry because some postulates can be interpreted in geometric terms, as the definition of the essential elements of any geometry of space/time (the point, 1st postulate; the line, 2nd postulate and the plane, 4th postulates) and some in logic terms, as the description of the different causal chain of events that can happen when st-points enter in communication - 3rd, 5th and 4th postulates:

Thus, the 5 postulates of Fractal Logic define a point with parts, a line as a wave and a plane as an organic network of space/time points. The 3rd postulate explains the logic interactions of those points according to their relative equality=self-similarity of inner form, *required to start an organic process of eusocial evolution*; and the 5th postulate that explains the processes of absorption of waves of energy

and information that the point *gauges to act-react into the Universe*:

1st Postulate: *'A fractal point is a world with an inner content of energy and information that creates its 3 inner dimensions of space and an external motion that creates its dimension=arrow of time'*

2nd Postulate: *'A line is a wave of fractal points.'*

3rd Postulate: *'2 fractal points are self-similar when their external, spatial perimeter or their inner information is equal. Similar points form organic networks by sharing their energy and information.'*

4th Postulate: *'A plane is a network that joins points through waves of energy and information.'*

5th Postulate: *'A fractal point has inner apertures to the world, through which multiple waves of energy and information can cross.'*

In the graph, that opens this section, we showed the 5 postulates of Fractal, i-logic geometry. Advances in sciences always depart from the evolution of mathematics and logic, the languages of space and time of the human mind. Then with those 2 languages, each science explains one of the 'fractal space-time scales' of reality and its species of energy and information, which are parts of those organic scales. The 5 postulates of i-logic geometry based in the concept of a fractal point and the advances of fractal mathematics, topology and Non-Euclidean geometry, achieved that evolution. In the graph, from top to bottom we describe those postulates. The first postulate explains a fractal point, as a point with parts. In a more detailed analysis those parts turn out to be self-similar in geometrical terms, in all systems, due to the specific lineal vs. cyclical, concave vs. convex

geometries of energy and information and its ‘planar combinations’. In its more complex versions those geometries are defined by the three canonical topologies of a four-dimensional Universe, which describe the informative ‘head’, reproductive ‘body’ and energetic limbs and membranes of all the superorganisms of the Universe. The 2nd, the interaction between two points connected by a wave of communication or ‘line’, the 3rd, the type of ‘biological’ interactions between 2 points according to their relative equality, and finally the 4th, the complex structure of a system of points across multiple organic space-time planes, such as those who create a human being.

Further on, according to the duality between geometric form and logical function, those postulates of fractal i-logic geometry define also the basic arrows= cycles/dimensions of the Universe: the 1st and 5th postulate define a point as a system whose inner parts are able to transform and emit energy and information, $e > i < e$; the 2nd postulate defines an exi wave of communication that reproduces energy and form between 2 fractal points; and the 4th postulate defines the social evolution of a herd that creates a fractal plane, a network with dark spaces; and the 5th postulate explains a point in its iterative actions as it absorbs energy and transforms it into information through its small apertures to the Universe. Since even a minimal quark of mass, as Einstein affirms should be crossed by ∞ parallels.

The importance of the ‘linguistic laws’ of i-logic geometry resides in the fact that all systems of the Universe follow in space the laws of geometry and in time, the laws of logic, so the enhanced linguistic mind of science obtained with those laws can be used, as this author has done in multiple works to resolve long-standing questions in all sciences, which can

further be ordered in a pyramid of increasing information and diminishing energy: Physics studies the simplest forms with maximal energies. But if we consider the 2nd arrow of ‘creation’ of reality, that of form, of information, the summits of science are biology, which studies the most complex forms of information (life) and Sociology/Religion, which goes a step further into the analysis on how the arrow of eusocial love creates Human Societies according to the Organic laws of the Universe (eastern religions).

To be able to consider biologic behavior (social evolution) and ‘mental perception’ (informative gauging), as factors dependant on geometrical qualities is an astounding breakthrough for science, which will be developed in its details in this work, to show an enormous number of experimental proofs. Indeed, fractal, i-logic Geometry achieves a long-sought goal, which Plato, Spinoza and Leibniz tried to realize, but failed, with the use of simpler Euclidean geometry: to unify the logic and mathematical principles of the Universe. Since the 3rd and 5th Non-Euclidean postulates are logic, the 1st and 2nd are geometric and the 4th, the nature of a topological plane or network of non-E points is both logic and geometrical, as it defines the fundamental logic-geometric structure of the Universe: the superorganism.

The logical and mathematical conclusions we shall arrive in this chapter are the same we achieved in the previous one with a more descriptive, less formal analysis: the Universe’s final goal is to create ‘topological, organic planes, superorganisms’ – the 4th, more complex ‘geometrical postulate/form of reality’ – departing from simpler forms, points and cycles. We shall try to get to that conclusion step by step, first by describing the geometrical postulates, then by fusing them with fractal mathematics and finally by

studying the most fascinating of all of them, the 3rd postulate, which proves that behavior among the points of the Universe is based in the degree of equality or self-similarity between their inner form that determines if those forms communicate symbiotically or destroy each other, thus defining the duality of eusocial evolution as a group of a number of self-similar beings or destructive extinction.

Some, first-hand consequences of those postulates are:

- *1st Postulate*: We correct Euclidean geometry, increasing and relativizing the dimensions of a point that fits inner energy and information. Since all points have either 1 motion, a time dimension, when we consider them from the perspective of the upper $st+1$ Plane for which they are in the limit of invisibility (what quantum scientists call a point-particle) *but still has a motion or 'function' in that upper ecosystem, $st+1$ in which it exists*, and 3 dimensions/networks/functions when we consider them from the inner perspective of the point. This is the case even in the smallest planes of theoretical strings, made of points with parts, with volume – since we require $3 \times 3s+1t$ theoretical inner dimensions to describe them - a paradox that can only be resolved if we consider the to be ‘strings’ of fractal points with inner, fractal dimensions.

- *2nd postulate*: When we observe a one-dimensional line as a form with inner parts it becomes then a 4-dimensional wave made of cyclical points with motion. Hence in quantum theory we say that any particle in motion has associated a wave. *Thus the 2nd postulate resolves the wave/particle duality*, as all lines are now waves traced by a point with inner volume. Further on, since all lines have volume, they carry information and so all forces can in fact act both as a source of energy and as a language of information - as

physical experiments prove. Since when we observe a ray of light in detail it becomes a 4-dimensional wave with electric height and magnetic width, often exchanging flows of energy and information in action-reaction processes of communication between bigger points.

- *3^d Postulate*: Equality is no longer only external, shown in the spatial perimeter of any geometrical form (3rd Euclidean Postulate) but also internal and further on it is never absolute but relative, since we cannot perceive the entire inner form of a point – hence the strategies of behavior such as camouflage. Forms are self-similar to each other, which defines different relationships between organic points, according to their degree of self-similarity. The 3rd postulate is thus the key to explain the behavior of particles as the degree of self-similarity increases the degree of communication between beings. Some of the most common behaviors and ‘events derived from this postulate are:

1) Reproductive functions in case of maximal self-similarity or complementarity in energy and form; $e_i \rightarrow \sum e_i$ or $\text{Max } E \times \text{min. } I (\text{male}) = \text{Min. } e \times \text{Max } I (\text{female})$.

2) Social evolution, when points share a common language of information, $i=i \rightarrow 2i$.

3) Darwinian devolution when forms are so different that cannot understand each other’s information and feed into each other: $i \neq i$. In such cases if those 2 entities meet they will start a process of ‘struggle for existence’, trying to absorb each other’s energy (when $E=E$) or simply will not communicate (when $E \neq E$, since then there is neither a common information to evolve socially nor a common energy to feed on). Yet because any point absorbs only a relative quantity of information from reality, self-similarity is

relative and it can be faked for purposes of hunting, allowing biological games, such as camouflage and capture, or sociological memes that invent racial differences, allowing the exploitation of a group by another.

The geometric complexity of the 3rd Postulate is caused by the topological forms created by any event that entangles Multiple Spaces-Times. Since it describes the paths and forms of dual systems, which connect points: Self-similarity implies parallel motions in herds; since equal entities will maintain a parallel distance to allow informative communication *without interfering with the reproductive body of each point*. Darwinian behavior implies perpendicular confrontations, *to penetrate and absorb the energy of the other point*. Finally, *absolute, inner and outer self-similarity* brings bosonic states, which happen more often to simpler species like quarks and particles that can form a bosonic condensate as they do in black holes, *where the proximity of the points is maximized. And indeed, the same phenomenon between cells with the same inner information /DNA originates the 'collapse' of waves into tighter organisms*.

The 3rd Non-Euclidean postulate is implicit in the work of Lobachevski and Riemann who defined spaces with the properties of self-similarity (Riemann's homogeneity), which determines its closeness (Lobachevski's adjacency).

- *4th postulate*: Now because a plane has an inner volume – that of its points - it is a cellular, organic topography, a network of self-similar points. And because networks of points of energy and information are complementary, often we find systems with 2 complementary networks that form ever more complex geometries – based in the geometrical dualities of lineal energy and cyclical information – with the

results we observe in nature: *the creation of an enormous number of complementary systems which are, as we shall see latter, all of them self-similar in its geometries and functions*. Thus, the types of Non-Euclidean planes of space-time range from the simplest Euclidean planes to the more complex organisms with a volume given by the relative point/beings that form its space-time networks.

Thus, a plane becomes a real topography made of points with volume, extended as a cellular surface. We can observe its surface as a bidimensional membrane of information (for example your skin, or the screen of a computer made of pixels, or the sheet of this work). Or we can consider the 3-dimensional inner structure of its points and then it becomes a network with inner motions, as those points will form a lattice in which they communicate lineal flows of energy and information that maintain the lattice pegged. Often 2 topological planes of energy and form combine to create a 4-dimensional organism. Such is the most common structure of the Universe, a 4-dimensional World, which is a Universe in itself, made of self-similar cells or networks of points that constantly exchanges energy and information within the ecosystem in which it exists.

- *5th postulate*: It defines points as informative knots or linguistic eyes - minds of information that absorb a flux of forces used by the point to perceive a relative world. A non-Euclidean point corresponds then to our concept of a relative mind that gauges the information reality with a certain force, similar to the concept of a monad in Leibniz relativistic space-time. In words of Einstein: a point of space is a fixed frame of reference.

Thus, Non-Euclidean mathematics fuses the logic and geometry of the fractal Universe, greatly improving our

understanding of Reality even in terms of mechanist measure. Since mathematical solutions to problems with several points of view are impossible to find in continuous space (i.e. 3-body problem in gravitation), given the fact that a network of infinite points of view is local and relative and each point is a focal knot that acts from its perspective. Thus, the absolute truth of a system is the sum of all its points of view, which influence each other. Yet even if we cannot calculate precisely with mathematics, systems with more than 2 bodies, since those systems are organic, hierarchical, made of networks with attractor points, fractal structures and self-similar paths, the new mathematics of attractors, fractals, scales and Non-Euclidean systems, refine greatly our analysis. In essence, indeed, we observe that 'networks' integrate parts/points into wholes, which then 'act' as a single point. So in the complex models of i-logic geometry we can tackle many problems by defining sets of points as 'wholes' of a 'higher space-time'.

But the most rewarding consequence of the new language of the mind is the 'deep' understanding of the meaning of many experimental facts about the species of the Universe till now merely explained as hows. For example, the previous principle of local measure, where each point is a relative center of the Universe, is called in relativity the diffeomorphic principle, which now becomes explained as a partial case of the wider law we called the 'Galilean paradox'; the duality particle of information/wave of energy becomes a specific case of the application to physics of the duality of energy and information found in all systems and so on. The expansion of the laws of quantum theory (complementarity principle) and Relativity (relativity of scale, local measure, etc.) to other sciences and the organic principles of the 3rd and 4th postulate to physical particles is

therefore the consequence of those postulates. Yet it requires the understanding of the new, i-logic, organic laws of the Universe and its networks, because E-mathematics has clear limits to extract all the information of the Universe, given the fact that its syntax includes a priori errors and simplifying postulates (single space-time continuum of points without parts, etc.). Thus, when the event described is complex, performed by a great number of points /variables you enter into non-linear systems, which require topological descriptions (chaotic attractors, fractal non-differentiable equations and Non-Euclidean mathematics), and the i-logic laws of organic networks and systems – a better syntax in which to fit experimental evidence, especially in phenomena of informative nature (since only formless energy is continuous and resembles the models built with a single arrow of energy and a single plane of space-time). So while classic physical systems calculate accurately the energetic, continuous properties of the Universe an overview on how multiple points of view emerge into wholes requires organic laws. Of course, this search of whys also applies to the understanding of mathematics. For example, the previous postulates resolve the long-standing question of what is the nature of the 3rd and 5th postulates that seemed redundant (as the 5th describes also properties of a point like the first does, and the 3rd seem to describe a non-geometrical property). They are no longer redundant, but they are more concerned with causal logic and time than spatial geometry in its purest forms (points, lines and planes.)

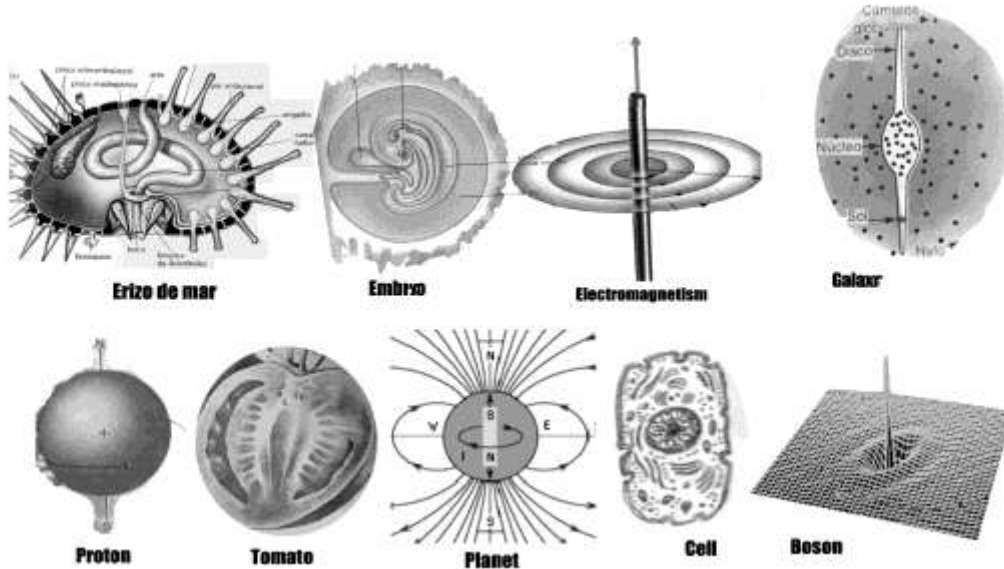
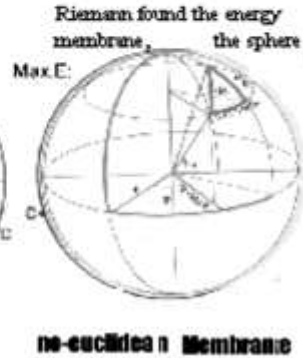
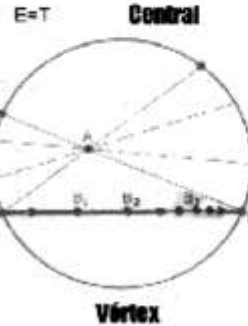
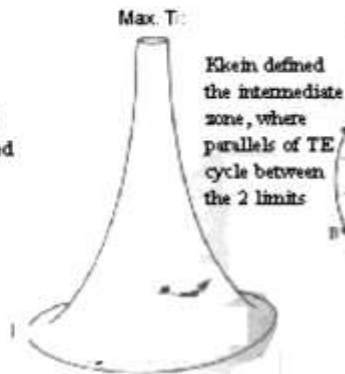
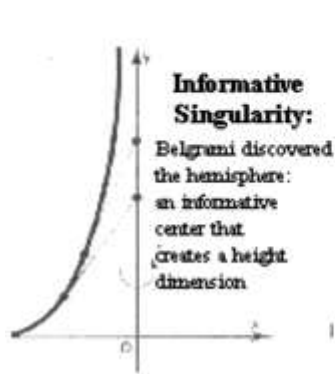
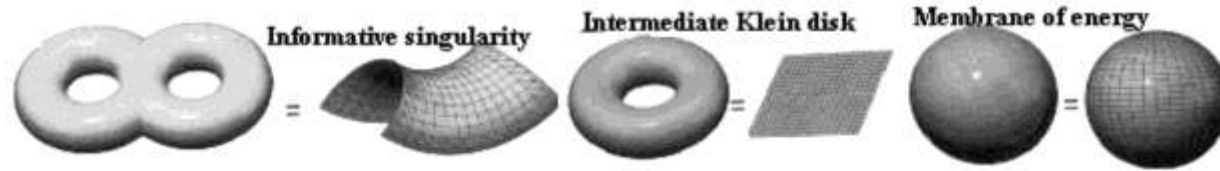
There is also self-similarity between the fractal postulates of i-logic geometry (since the 5th is geometrically self-similar to the 1st, as both are concerned with points) and the 4 dimensional time paths/arrows of the universe. This is not casual since all languages of space-times depict in self-

similar ways the 4D Universe. Thus if the 1st and 5th postulates define *a gauging point of information* as the fundamental unit of the Universe, the 2nd postulate defines a line or flow of communication of energy and information between 2 points, which *reproduces* part of the information of the ‘generator’ point across a surface of space; the 3rd postulate defines those points, which are not similar as *energetic* substances that will be absorbed by the points. Yet if those points are self-similar they will gather through the arrow of eusocial love, creating according to the 4th postulate a network of space/time, a new organic plane of existence. So the 4 arrows of space-time are explained by the 4 postulates of i-logic geometry.

Recap. The study of the geometric paths of Time Arrows with the tools of mathematics, explains the whys of mathematical laws: Geometry and topology acquire now its ‘why’: topology explains in detail the 3 canonical parts of all Points of view, while the i-logic postulates of geometry explain the universal structures that those points of view create.

In organic terms, the 5 postulates of fractal Geometry describe how points become parts of social webs, which self-organize fractal planes made of networks of points, which emerge as cellular units of a higher fractal space-time or new superorganism... Thus, according to the Principles of Correspondence and Relativity, proper of physical reality, those different geometries are relative descriptions of the same fundamental structure of the Universe: the point with parts and its more complex social forms, lines and planes. The fractal generator of the Universe is a logic equation that represents the main interactions between the arrows of time. Yet all languages mirror that logic equation in its syntax, since all minds gauge and represent the cycles of the Universe with languages of perception.

III. 1ST POSTULATE: POINTS WITH PARTS: THE 3 FRACTAL TOPOLOGIES OF ORGANISMS



13. Topological Spaces. The why of geometrical forms

Reality is made of fractal points, which are knots of Time Arrows, able to perform energetic, informative and reproductive functions. As complex as one of those points-entities might be when observed in detail, *any fractal point is made of 3 regions whose geometry responds to the topological forms of a 4-Dimensional Universe, the convex plane, the torus and the sphere.*

The Universe comes down to two bidimensional elements, energy and information, and its 4-dimensional combinations. Thus all entities can be described as wholes made of 3 internal parts whose geometrical properties maximize their energetic, informative and reproductive functions:

- Max Ti: an inner, dual center, corresponding to convex topologies (left), made with 2 cyclical forms. It is the dominant informative topology of any fractal organism, described by Belgrami in the XIX c. as a conical form with 'height', with negative curvature.

- \Leftrightarrow : A middle, reproductive zone, described by Klein as a disk of quanta in cyclical motion that communicate energy and information between the inner and outer zones.

- Max. E: An outer membrane of energy, described by Riemann's spherical geometry.

When we see fractal points far away we describe them as points with breath, with the tools of Euclidean geometry since the 'inner space' shrinks to a point and so the 'bulk' or curvature of space-time shrinks to a plane. Yet, when we come closer to them, they grow into points with volume. The volume of those Fractal, Non-Euclidean points can thereafter be studied with the 3 types of canonical, Non-Euclidean geometries or topologies of a 4-Dimensional Universe – the

Universe we live in. Those 3 topologies make up the 3 regions of the point, which correspond each one to the 3 essential arrows/functions of any species: the external, energetic membrane; the central, informative brain and its reproductive combination, exi.

It follows that the first part we observe in a point is the external membrane, which without detail seems to have a continuous, energetic appearance. But on close view, we observe most external membranes store and/or absorb information (Holographic principle) due to its fractal geometry. This can be generalized to any membrane which shows a 'bidimensional surface' that acquires more form, more 'fractal steps' when we come closer to it. Thus, the Holographic principle, which physicists know in the restricted field of black hole theory but can't explain why exists, is both explained and extended to any bidimensional membrane of information. We find bidimensional, warped, fractal membranes that store information not only in black holes, but also in the development of organic senses, departing from the exoderm (external membrane of the fetus), in the seminal cells that reproduce life, formed as an outgrowth on the body surface (genital systems) or in the complex forms pegged to the surface/skin of the Mandelbrot and Julia sets, the best known mathematical fractals.

This external, energetic membrane has the topology of continuous surfaces called *the Riemann sphere*, which is the external surface of any point - the skin and limbs and any of its multiple self-similar entities, some of which are drawn at the bottom of the graphic. In any system of the Universe, the membrane acts as the energetic, external surface of the informative, point through which the point absorbs energy from the external Universe, to process it into information.

- The toroid, which is the body or reproductive region (seen as a cyclical path of space-time), which fills up the space-time between the nuclei and the external membrane. It is the zone where the reproductive organs of the system exist, and where the information of the system is born.

- Energy and information systems have inverse properties, being energy expansive, external, more extended, and information, implosive and smaller. It follows that we will find the informative head or system either on top of the reproductive body, with a spherical and smaller size or in the center, and its topologies will correspond to those of maximal form; the so-called *hyperbolic topology*. In the upper graph, it is the double ring, or convex, hyperbolic surface, with maximal form, or informative center of any entity of the Universe, the point in which the fractal reproduction of information reaches its zenith. It is the same form than the toroid but reproduced into a higher content of information, by doubling the initial form.

- Finally between both topologies of energy and information, the point will have a middle region of exchange of energy and form, made of cycles that go back and forth between those regions, which correspond to *the 3^d canonical topology*. It is the torus, plane or Klein disk - a curved region of energy & information quanta, with cyclical motions, confined by 2 limits, an external, spherical membrane of max. energy and an internal informative nucleus. It must be noticed that according to Klein, the topologist that studied better this type of surface, the toroid is NOT really a fixed form of space, but we must consider those cycles' motions and add the parameter of speed. Thus Klein introduces the Paradox of Galileo to describe the Non-Euclidean geometries of the Universe as we have done in this book. Cycles are

mere static perceptions of motions and we must always consider distances as space-time distances. So we say: London is at 4 minutes distance because we consider distance and speed together. This is ultimately the meaning of time in physics, a measure of the speed of motion as a way to gauge space-distances: $v=s/t$.

In the graph, we observe several non-Euclidean points created by those 3 canonical topologies that can adopt multiple forms by deformation, but suffice to construct all the shapes of our Universe. Indeed, a topology is deformable. So an external membrane, which corresponds to the topology of a sphere, can become any shape, as long as it is not torn up, to enclose a reproductive and informative zone. So your skin is in topology a sphere, which encloses the complex forms of your reproductive organs. Those organs are Klein cycles of great complexity that exchange energy and information. Since those 3 topologies suffice to describe any 4-Dimensional form, it follows that the Universe is merely a puzzle of energetic, informative and reproductive parts, associated in 'numbers', groups and all kind of entities as those shown in the previous graph, from different sciences, which are created with those 3 topologies.

The 5 Non-Euclidean postulates and 3 topologies common to all species prove that all are complementary, fractal points, made of regions that process spatial energy and regions that gauge temporal information, both of which according to the paradox of Galileo have always motion and form together cycles of exchange of energy and form, in its intermediate dynamic, reproductive region. This is what Lobachevski, Riemann and Klein discovered when they invented Non-Euclidean Geometries in the XIX c.: Euclidean space is a simplification of a moving space, made of points with

volume that constantly trace cycles.

In a 4-D Universe there are only 3 topologies of space, which actually display the properties of energy, information or a combination of both, the 3 canonical topologies structure the inner geometry and functions of the organs of any species, proving the homology of all space-time fields in the Universe. In the graph, an animal, an embryo, an electromagnetic flow, a galaxy, a proton, a seed, a planet, a cell and a boson display the 3 topological zones of a fractal point, each of them performing 1 of the 3 functions/arrows of space-time.

Topology *describes the internal parts of Non-Euclidean points when we come closer to the 'fractal point' and see its 'formal parts' in more detail, as we do in the previous graph, with several* systems of Nature made of those 3 topological regions that correspond to the 3 main arrows of time of each of those systems:

Information x Energy = Reproduction

Those arrows are performed within each space/time point of the Universe by each of the 3 topological regions, which allows in the complex models of Multiple Spaces-Times to understand causal processes of transformation of energy unto information as topological transformations. While the 4th arrow of social evolution, which requires more than a point, is described by the 2nd and 4th postulates of lines and planes.

Topology confirms a fundamental tenant of Multiple Spaces-Times, the 4-dimensionality of the 'Holographic Universe' made of bidimensional energy and information, which combine its properties to create the 'visible', bulky regions between the informative center and energetic membrane of those points.

Each of the 3 elements of fractal points displays the properties of one of the 3 Time Arrows: the center has height, it accumulates information and it is small. The external membrane is larger, continuous and protects the system. The intermediate zone reproduces the information given by the center with the energy absorbed by the membrane creating new energetic and informative bites and bytes, which latter migrate towards the other 2 zones.

- Informative particles accumulate in the inner region as units of the central brain. Or, if they are seeds, they migrate to the surface of energy *where they become fractal systems of information, senses in organisms, informative human beings in the Earth-crust, ovules in mothers*. And once detached, they start a fractal, reproductive, palingenetic process.

- While energetic particles migrate to the membrane, integrating themselves as part of a continuous protective shield. So in a cell we find mitochondria that produce energetic proteins and RNA for the surface membrane.

The internal, reproductive region happens also in all systems. In the human body the organs reproduce the cells needed for the blood network and the hormones and products used by the brain. In a galaxy, the intermediate region produces energetic stars and informative black holes, which migrate to the central region; in an ecosystem, the territory of the informative center, the predator, produces preys in which the predator feeds, bringing them to its central den.

Recap: The fundamental Particle of the Universe is neither physical nor spiritual but logic-mathematical: the fractal point described by the Laws of Non-Euclidean, fractal Geometry and topology, as an entity which becomes more complex when we come closer to it, till we can differentiate its 3 regions, corresponding to the 3 topologies of a 4-dimensional Universe: an

energetic membrane, an informative center, and an exchange zone of bites of energy and bytes of information between both.

14. Formalism of i-logic geometry. Causal Algebra.

The ternary structure of all points formed by the 3 topologies of a 4D Universe can be expressed with the symbols of the ‘Generator Equation of energy and form’:

- Max. ΣS : An external membrane or *sphere* of maximal extension, described by Riemann’s spherical geometry.

- \Leftrightarrow : A middle, reproductive plane or *toroid*, whose cyclical paths happen between the skin/boundary of a sphere and a central hole, described by Klein as a disk, made of quanta in cyclical movements that communicate energy and information between the inner and outer zones.

- Max. Ti . The inner, dual center - a convex hyperbolic, informative, central couple of disks, which display maximal form in minimal space, with a growing dimension of height that touches the poles of the sphere and channels the flows of energy and information of the system. It is the dominant informative topology of any fractal organism, described by Belgrami in the XIX c. as a conical form with height with negative curvature.

Since function is form, those 3 topologies are perfectly suited to perform the 3 temporal functions of any super-organism: energy feeding, reproduction and information.

So we can write with causal arrows the topology of each point and its 3 regions: $\Sigma S < EXI > Ti$.

The 3 non-Euclidean geometries structure the geometry and functions of the organs of any species, proving the homology of all space-time fields in the Universe. In the graph, an animal, an embryo, an electromagnetic flow, a galaxy, a

proton, a seed, a planet, a cell and a boson display the 3 topological zones of a fractal point, each of them performing 1 of the 3 functions/arrows of space-time.

There is in that sense only a small correction to classic topology needed to fully understand the structure of organic systems with the 3 topologies of reality. In topology we distinguish two types of spaces called closed balls and opened balls. Open balls are spheres with a center 'a' and a maximal distance/radius, r (from a to its surface), defined by all the points x, such as $x < r$ (therefore an open ball does not include the surface or perimeter r); and closed balls are spheres which include all points $x \leq r$.

In i-logic geometry, all organisms are both, closed and opened balls, depending on our perspective.

As closed balls they include the 3 regions, previously described which are, a, the hyperbolic center; r, the perimeter; and x, the points of the intermediate space.

The intermediate space is on the other hand, an open ball, which does not include the membrane, r, as it constantly exchanges energy and information with the external universe; *but it does not include either a, the center, so it is also opened inwards, to the information system.*

This is for example, the case of a black hole, which is wrongly understood in classic physics, *since the black hole has 3 regions, a, the singularity, Σx , the quark-gluon soup of extreme density, whose cyclical mass vortex are the black hole in itself, and r, the event horizon, which is not the black hole per se, but the membrane of exchange of energy with our electromagnetic space the black hole warps and feeds on.*

Recap: In a discontinuous Universe there are infinite fractal points, but all of them are composed of the same 3 ΣS , EXI, Ti

zones; the external membrane, the intermediate region and the inner center.

15. Mathematic description of the 3 regions of a st-point

The complex analysis of those fractal points that move and have inner fractal parts, made of cycles, started in the XIX century. First Lobachevski, a Russian geometrician, defined Non-Euclidean points as curved forms, crossed by multiple lines, which give them spatial volume. Then Klein studied its cyclical movement and introduced the variable of time in their description. Finally Riemann generalized its nature, considering that all space-times were Non-Euclidean space-times with movement. For those readers well versed in mathematics, we shall now reconsider the common properties of those 3 zones of any fractal point, according to its discoverers, which develop in abstract terms the organic properties we have just described:

- *According to Lobachevski and Belgrami*, space is curved since information curves the energy of any real space-time. So points move in curved, cyclical paths gathering energy and information for their inner ‘dimensional networks’.

- *According to Klein* Non-Euclidean space-times have motion. So their speeds measure distances; as physicists do in Cosmology with the distances of galaxies, which are proportional by a ‘Hubble constant’ to their speeds; or as people do in real life when we say that Brooklyn is at 5 minutes by train from Manhattan not at 2 miles.

- *Riemann* summoned up those findings and generalized them to all possible space-times. His work should be the guide to understand them philosophically. He also defined planes as networks of similar points and treated dimensions, as we do in this work, no longer as mere abstract definitions

of extensions but as ‘properties of those points’. So points can have beyond its discontinuous borders an inner space-time with several networks/dimensions, one for each of its ‘energetic or informative properties’, as it happens with the points of physical reality. Yet a network of points that form a space with ‘common properties’ defines the dimensions of those points as ‘fractal dimensions’, limited by the extension of the energy or informative network (static point of view), which ‘puts together’ a complementary dual, organic being.

Those 3 mathematicians defined the 3 topologies of information, energy and reproduction of all st-points:

- *Max. Information: The informative, fractal center, particle or brain of the point is the so-called hemisphere of Belgrami*, a space-time with a dimension of height that transforms energy into information, absorbed or emitted by the central singularity. It is a fractal, informative region similar to a black hole structure. Since it follows the ‘black hole paradox’ of all informative centers, displaying max. form in min. space. So according to the inverse properties of space and time, the center has max. Informative Time and minimal Energetic Space. Moreover any point which comes closer to it, suffers a mutation of its spatial coordinates into informative, height dimensions. This is the case of any particle coming to a black hole, whose space-dimensions become temporal/informative dimensions as it rises in height.

The center has more information because its geometry has at least 2 fractal disks, which channel and transform the energy absorbed through the surface into complex information. Regardless of the complexity of the entity, the structural function of the hyperbolic center as a system that process the information of the network remains. For example, in living systems, those disks might evolve its topology till

becoming the relative energy center or 'heart' of the blood network with 4 divisions; or evolve further its hyperbolic geometry till becoming the informative center or 'brain' of the system, attached to the informative network.

- *Max. Space*: An external, continuous membrane or Riemann's sphere of maximal energy that acts as a relative infinite, unreachable distance. The membrane isolates the point as an island Universe, creating the discontinuity between the inner parts of the point and the outer universe. Since the internal cellular points are either jailed by the membrane's structural density or destroyed by its energy when touching it. The membrane is the opposite form to the central, informative singularity, with max. spatial extension and continuity, hence with a minimal number of fractal, discreet elements: $Max.\Sigma Se = Min.Ti$.

Thus all Fractal points are 'inner worlds' whose membrane creates a discontinuity that defines an External Universe or outer world from where the point obtains its energy and information. However the membrane is also the zone through which the point emits its reproduced micro-forms of information, and so it displays 'sensorial holes' to relate the point to the external Universe. And those points, despite being discontinuous, will have in their external membrane several generic openings or 'senses' joined to the informative networks or 'brains' and energetic, 'digestive networks' of the organic system:

- *Max. + ΣSe* : A 'mouth' or opening that absorbs energy.

- *Max. - ΣSe* : 'Cloacae', through which the cyclical body expels its temporal energy.

- *Max.+ Ti* : An 'eye' through which the informative center receives external information.

- *Max.- Ti* : An 'antenna' to emit information.

Those apertures vary in their number, location and size, depending on the form of the point. In the simplest spherical 'seeds' of most species, they are mostly situated in 3 regions:

- *Max. ΣS* : The Equator of the system, through which the membrane absorbs energy.

- *$\Sigma S = Ti$* : The Tropics where often the same opening emits and absorbs temporal energy.

- *Max. Ti* : The Poles or points of confluence between the membrane and its central informative region of height, which hits perpendicularly the membrane on those poles. North and South Poles orientate Anti-symmetrically, acting as 2 relative, negative and positive apertures, communicated by the height dimension of the singularity or Belgrami hemisphere. Thus the Positive Pole absorbs temporal energy that crosses through the central singularity where it is absorbed and ejected to the intermediate region where it is re-laborated before its emission through the negative Pole.

- *$\Sigma S \Leftrightarrow Ti$* : The reproductive, central region, which combines Energy and Information:

In all fractal points there is an inner middle volume or intermediate territory, discovered by Klein, which combines the energy coming out of the external, spherical, topological membrane and the information provided by the convex, complex formal center.

According to Non-Euclidean mathematics this region is made of self-similar points that form groups, fractal herds of 'points with parts' in perpetual movement, that draw cycles of parallel lines, between the other 2 regions, as they gather

the energy and information they need to survive. And they create space by cycling within the other 2 regions.

In many fractal points the informative and energetic centers establish 2 opposite flows of energy and information that become the negative/ positive poles. So often, the particles of the intermediate region cycle around the inner region tracing elliptical trajectories, focused by those 2 informative points. It is the case of any bipolar system, from binary stars, one dominant in energy and the other an informative neutron star or black hole; to bimolecular systems or n-p pairs in the nuclei of atoms. The same duality of 2 specialized centers controlling a common territory, or vital space happens in biology where most species have male-energetic and female-informative genders, ruling a common territory.

Such abstract conceptual space describes in fact the behaviour and form of many real, spatial herds. For example, a herd of animals in an ecosystem will move between their hunting and water fields (where they gather energy) and their breeding, inner region where they reproduce information, making cyclical trajectories between both regions. In this manner, they occupy a vital space, called a 'territory', which shows the properties of a Non-Euclidean Klein space. A fundamental property of the intermediate space is the fact that it is confined between the other 2 regions, which are never reached in the cyclical trajectories of the inner cells of the space. For example, in a cell, the molecules of the organism will not touch the protein membrane or the central DNA nuclei. Thus, the inner quanta are confined within the Klein's disk by the 2 other regions, which have more energy and information and might destroy them and/or absorb their energy and information at will.

In abstract terms, mathematicians introduced in the XIX c. the concept of an *infinite, relative distance* measured no longer in terms of static space but in terms of time and movement, as *the distance between the point and a region that cannot be reached*. Thus Klein defines a relative infinity, as the region beyond the discontinuous membrane whose insurmountable borders the inner time-space quanta can't cross, as a cell cannot go out of a body, an atom beyond C speed or 0 K temperature and a man beyond the Earth's atmosphere. Thus, the informative center and external membrane become the 2 relative infinities or limits that the movements of the intermediate point cannot breach.

As in the myth of Achilles and the turtle, Achilles never arrives because every time he moves he crosses a smaller spatial distance. The same happens in a fractal space-time, when a point moves *temporally* towards its inner or outer space-time limit and finds an increasing resistance to its movement, till finally it is deviated into a cyclical trajectory around the outer, energetic membrane or the height dimension of the inner informative singularity or is destroyed. So the intermediate, fractal cells of the point circulate in parallel cycles always inside the interior of the sphere with contact zones of the type A (*central, 2nd row of figures in the previous graph*).

In a human organism, the blood system might seem infinite for the red cells that transport energy since they never reach the outer Universe. For that reason in the drawing, Klein interprets the intermediate region of the Non-Euclidean point as an infinite *circle with an invisible, unreachable membrane*, whose motion-distance is unreachable, hence infinite, equalling the 'space-time distance' between the intervals B1-B2 (long) and B2-B3 (short but difficult to

cross), despite being B2-B3 increasingly shorter in space. Since the quanta take longer in each step and don't reach the membrane. This is often due to an increase in the 'density' of the space, which despite having less distance has more 'points' in its network, such as the case of black holes or jails. When those inner points reach the membrane at point C they become destroyed or deviated.

Thus, the energetic membrane and informative center are the discontinuities that isolate the intermediate cellular quanta, creating a discontinuous 'World' within the point. Those discontinuities are called in Geometry a relative infinite, in Biology a membrane, in Sociology or Topology a national border, in fractal theory a co-dimension of a point. They are defined in physics by Lorenz Transformations that make c the limit of energetic speed and 0 K the limit of temporal, formal stillness. Yet those physical limits are not the limits of an absolute Universe, but the limits of the fractal space-time membrane of light and its evolved electroweak beings, since the Universe has at least another bigger gravitational membrane, in which the smaller light-space exists; a fact with enormous repercussions for a proper description of the Cosmos, which extends beyond those limits. Since the gravitational scale should be faster than light-speed forces and cooler than 0 K masses.

Recap: Fractal points are organic points, whose topologies maximize the energetic, reproductive and informative cycles they perform. The details of those cycles are described by Non-Euclidean topologies.

16. Dimensions of the 3 regions: Holographic Universe.

In terms of dimensions the spherical membrane and inner informative singularity are bidimensional fields: The central singularity is a bidimensional surface of convex in/form/ation

that curves the external spatial energy coming through the bidimensional membrane, creating together the 4-dimensional quanta of the intermediate region. For example, physical models of the inner nuclei of atoms made of informative quarks, define them as bidimensional, convex singularities. Black holes are said to store bidimensional information in its external membrane or black hole horizon. The computer screen or sheet of a book stores bidimensional information. The vacuum energy of the galaxy has a planar form and so on.

A 2nd consequence of the inner volume of points is a rational explanation to the concept of bidimensionality. Since now points have a minimal volume a bidimensional sheet of information has in fact a minimal height, but since reality is fractal and size is relative, from the 'giant' p.o.v. of our perception that depth of a sheet of paper or computer screen is a relative 'zero', yet makes bidimensionality 'real'.

Recap: informative regions have more dimensions of form than energetic topologies, more extended in space.

17. Morphological change and informative dominance.

Natural organisms start as spherical seeds of information and then through morphogenesis differentiate in 3 functional regions that ensure the capacity of the system to process energy and information and reproduce itself, surviving in the Darwinian Universe.

As the species changes and evolves into more complex shapes those functional zones are kept. For example, the informative egg evolves into the energetic, lineal larva or young phase of most insects, by *translating* the inner, informative center to the dominant, forward head region and the external membrane to the 'tail', but both functions are

preserved. Thus the inner informative regions migrate through the informative dimension of height to the dominant zone of the system. Yet the dominance of the informative center is not compromised:

In all systems we find a core/brane that acts as the dominant region of the organism and display paradoxically less spatial extension than the other regions they rule. It is the smaller nucleus of cells, humans and galaxies generates its information (DNA, human brain/eye system, galactic black hole, CPU (central processing unit) in computers, etc.).

In a galaxy the halo of dark matter and the central black hole dominate and seem to feed and form the radiant matter of which we are made. In man, the informative brain, extended through the central spine and senses, dominate the reproductive body and guide it.

The second region in importance is the 'body' or reproductive region, which becomes imprinted by the mother's information.

And finally the 3rd region of the system, which is easier to renew, due to its formal simplicity is the energetic region, the skin, limbs and membranes, which brings energy to the intermediate region to allow the reproduction of the information stored in the center or head of the system.

Yet given the infinite possible deformations of those 3 unique topologies of 4-D space-time shape, the Universe creates an enormous variety of species, from an original seed of information of spherical form, which develops those 3 regions in morphologies that soon resemble energy lines, reproductive cycles and information centers.

Our energetic region extends in lineal limbs; reproductive cells group into organs, becoming the body; while the

informative centers move to the height dimensional and multiply its cellular forms in the sensorial boundaries of the head.

All those processes studied by morphogenesis, can now be explained not only in its how but its why.

Recap: The 3 relative forms of energy (external membrane), information (dual ring) and reproduction (the cyclical paths that exchange energy and information between the external membrane and the inner convex form), can be found in any system of reality. In all those systems, the informative region dominates the bigger, simpler reproductive body.

18. The ternary structure of all Universal systems

The 3 functional topologies of a Non-Euclidean point become the 3 regions of all Natural organisms:

We can describe atoms with central, informative, massive quarks, electronic membranes and fields of gravitational and electromagnetic forces exchanged between them. We can also use those 3 topologies to describe the organic structure of the galaxy. Since the black hole has a hyperbolic, informative topology, the Halo of the galaxy has a Riemannian, spherical form, and the stars in the intermediate region, which feed the dark matter of black holes and reproduce the atoms of life, turn in cyclical, toroid paths around the central black hole.

Physical space-time is the simplest world where the most basic morphologies play that same process of transformation of external energy that converges and reproduces cycles, attracted by a Non-Euclidean point, charge or mass: $E=Mc^2$.

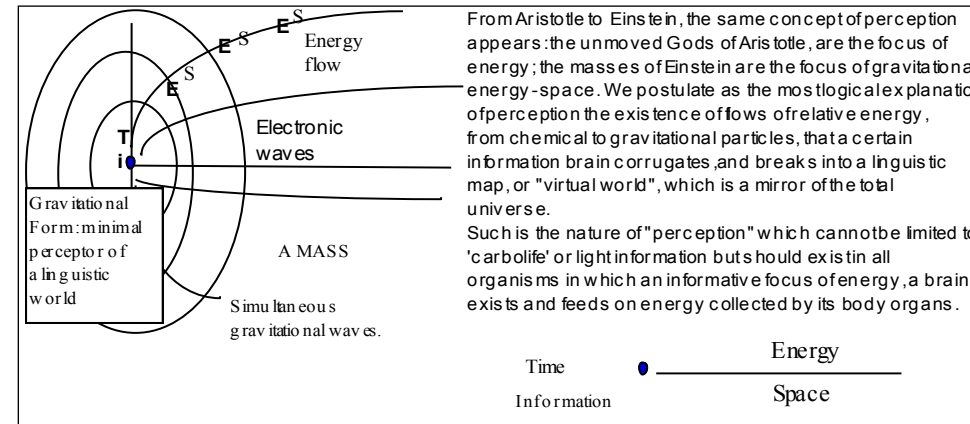
Cells have lineal, external membranes of proteins, which are a deformation of a Riemann sphere, an informative nucleus and in between they are invaginated by all kind of

$e \leftrightarrow i$ cycles that transfer energy and information from the outer world to the cell.

Finally, a human being has a reproductive body, lineal, energetic limbs and a cyclical head, with an informative, smaller brain, composed of two hemispheres, which are hyperbolic, convex, warped forms, corresponding to the informative dual ring of a Belgrami cone. The hyperbolic, highly warped brain is a double toroid, self-similar to the hyperbolic topology of informative cycles. And so the brain hosts more information in lesser space than the body, as a mirror of its functions. Man though, while responding to the same canonical topologies in his organs, is by far the most complex being of information known in the Universe. And so his topologies are immensely more complex than the simpler physical particles and its transformations just described.

Recap: All systems of the Universe are made with the 3 canonical regions of a non-e point, which perform the 3 arrows/functions of all existential beings. Galaxies show the topology of non-Euclidean point, with a complex informative black hole of maximal mass, an energetic membrane of dark matter, and an intermediate region of reproductive stars that create the atoms of the cosmos. Human beings have also 3 ternary regions, the cyclical, hyperbolic informative brain, the reproductive body and its organs that produce the energetic bites and informative bytes of the organism and the lineal limbs that cause our motions

IV. 5TH POSTULATE: I-LOGIC POINTS OF VIEW



19. Fractal points gauge information with infinite parallels

The fact that all points interact with the external Universe is explained by the 5th postulate of Fractal Logic, which completes the 1st postulate. The 5th postulate defines a point as a knot of communication of multiple flows of energy and form, which the point absorbs to obtain energy and information for its organic cycles of iteration.

Thus we introduce a new perspective in our study of a Non-Euclidean, fractal point *of view*: its capacity to gauge information and absorb energy, acting-reacting to the Universe. Since beyond those 3 internal regions the point feeds on an external world of relative forces, which provide the point with energy and information to map out reality and feed its body with motion. Thus, while energy and form will be different for each point according to the scale and form, all entities of the Universe will be able to absorb a relative number of 'infinite parallels' to create mental fractal mappings and keep on moving: light feeds particles,

intergalactic gas feeds stars; plants feed animals that feed man; stars feed the black hole, and so on.

In science, mathematicians and physicists seek to describe reality as ‘made of mathematical entities’; while logicians try to explain reality as a series of causal events. But only when we use i-logic geometry we can mix both approaches, describing reality as a series of ‘mathematical points of view’, or entities that ‘gauge’ the geometry of the Universe, constantly mapping out the universe, to achieve a ‘selfish’ will, the desire of all entities to feed on energy, gauge information, reproduce and evolve socially. Those points of view are thus ‘mathematical minds’ because they gauge and somehow ‘perceive’ the geometry of the Universe, acting according to that geometry as they gauge and move with an ‘automatic’ behavior, trying to absorb energy for their body, information for their gauging mind, and combining both, to reproduce ‘self-similar points’. So we shall consider that the Universe is made of i-logic, fractal ‘points of view’, akin to the concept of souls and Atmans in western and eastern religions’, of ‘Non-Euclidean points of view’, ‘monads’ or ‘Spinoza’s geometrical entities’, in western philosophy of science and mathematics; of ‘gauging particles’ in physics, or ‘informative DNA nuclei’ in biology and perceptive heads in biology. The size and form of all those points varies but all of them are spherical knots of information with sensorial apertures to absorb and emit energy and information, from bosonic particles to sound waves or light signals.

Leibniz, the first philosopher of modern science, which considered points as the ‘fundamental particle’ of the Universe departed from the hypothesis that all what exists can be reduced to such points of view, he called Monads. Yet those monads could either share energy and information

between themselves as they do on reality or become static, perfect non-communicative points. This easier choice – non-communicative points of view - was Mr. Leibniz’s error. Since the points of the universe are in perpetual communication as parts of networks of self-similar points, sharing flows of energy and information – waves of forces. The essence of any point of any relative space-time is precisely to be in constant communication with the Universe as a ‘knot’ of Time Arrows, which shares flows of energy and information with other points, creating the network-spaces of which reality is made. Points that communicate energy and information, that feed and gauge are real. What is the proper name for all those logic parts that exist, for all those points of space that perceive, gauge information, and act-react to it under a simple program of ‘survival’: grow and reproduce, exist, repeat yourself? We call them a Non-Euclidean point of view. And we affirm the Universe is made of such type of *points of view*.

Thus ‘mathematical, Non-Euclidean points of view’, whose ‘motions’ have a ‘will’ or ‘purpose’ - gauging information, feeding on energy and reproducing themselves’ – become the logic and geometric units that shape the networks of energy and information of reality, thanks to their capacity to communicate and share energy and form. Such type of points are more akin to the view of Eastern philosophers that consider the Universe made of ‘atmans’, which are knots of communication that anchor a certain entity to the world that surrounds them, which is only a part of the total Universe.

Since those mathematical points of view exist in many different fractal space-times or ‘scales of existence’ in which they gauge information with different languages and perceive different ‘worlds’ within their minds.

If you are a particle – an electron - you will see only light (energy) and darkness, and you will move to the light that feeds you, as we observe in electrons. If you are a human eye you will see all type of colors but red will be the color of energy that ‘feeds and attracts your eye (so you see bloody movies and like red meat). So there are an infinite number of types of organic points of view with different mental worlds, which gather into social networks that exist in different ‘planes of existence’ or ‘scale of reality’. Yet in all those systems the same game of ‘gauging’, ‘feeding’, ‘reproducing’ and evolving socially takes place.

We exist in a Universe, whose fundamental particle is not a material form, as simple science thinks, but points of time space, which mirror in their inner, i-logic, fractal topologies the information of their world, acting-reacting to the Universe. Thus only by mixing perception and motion, mathematics and organicism, we can define those points of existence, as the fundamental particles of reality and:

‘The Universe has a body and a soul called logos.’ Plato

So we describe a Universe with a geometrical how, the laws of Non-Euclidean points of views, the cycles they trace, the mathematical laws that describe those cycles; and a biological, temporal why: the will to move, trying to fulfill the 6 arrows of time. It is the game that all P.O.Vs of all planes of existences, from atoms to human beings perform.

Those logic and mathematical laws of points of view are the metaphysical laws of the Universe – *the only essential events/forms that repeat unchanged in all forms*. And so, a proper description of the Universe should start with the laws of i-logic geometry; then apply them to the 2 simplest motions of reality, lineal forces and cyclical masses/charges; and then, once those ‘immortal laws’ are defined for any

system of energy and information, science should use them to define the specific events of each scale of reality and its species, as we all play the same Game of Exi=stence.

Recap. A Universe made of motions in time, extending through multiple scales of relative space, requires evolving the human languages of space (Euclidean geometry) and time (Aristotelian logic), used to describe the simpler space-time continuum of classic science. This task started by the pioneers of modern science (Riemann, Darwin, Planck and Einstein) must be completed before we can study the properties of physical and biological entities with the new tools of Non-Euclidean mathematics, which describe a world of multiple, relative space-time networks made of points as Complementary entities with energetic and informative system or ‘Points of view’ and the new tools of Non-Aristotelian logic, which describe the creation of the future by multiple causes – all the points of view or agents that create a certain network space.

20. The equation of the mind.

The 5 i-logic postulates define the unit of reality as a fractal point that observed in detail is in itself a World, which contains within it all the mathematical topologies of the 4D cosmos. This can be deduced in a logic manner, through the equation of a mind/p.o.v., which can map out as a mirror the whole Universe we perceive in its infinitesimal mirror.

In the fractal Universe all systems of i-logic information gauge reality, transforming a force they absorb into a logic language, which mirrors the Universe. It is obvious that the essential particles, quarks, photons and electrons cannot have a wide mapping of reality unless the fractal scales of size are infinite (and then an atom might be the upper bound of a new scale - a nano-galaxy).

Yet even if reality has upper and lower limits of size and point-like particles are not fractal world but the limit of

universal form, those simple particles still gauge information and store some type of logic, mathematical computer-like structure that allows them to behave as they do, organically. Since particles orientate their position in a herd of self-similar particles; they move towards light, its energy, when the electromagnetic field is in its neighborhood and they decouple=reproduce into new particles when they absorb more energy. All those properties are the minimal properties we ascribe to a fractal ‘point of view’ or ‘mind’ in a broad sense – a structure that gauges energy and information, creating smaller fractal mirrors of reality. Such structure has within itself a minimal amount of geometric paths and logic processes that allow it to form the forces it uses as energy and information source. We thus call such structure a mind. Since any point of the Universe becomes a focus of infinite parallel forces that flux into the point, creating a static image of reality in Complexity, we define a Mind, as an infinitesimal mirror-world that reflects the infinite Universe:

$$0 \text{ (mind-cell)} \times \infty \text{ (Universe)} = \text{Linguistic Wor(l)d}$$

The equation of the mind, defined by the 1st and 5th postulates of illogic geometry, sets limits of truth in linguistic science, comparing the worlds created by any mind and the Universe at large, much bigger than any informative, mental, linguistic image we have of it.

Recap: All entities of the Universe gauge information and act-react to the external world. Thus we consider all entities to have a mind – an internal, linguistic mapping of reality made with those forces.

21. The human point of view: I = Eye + Wor(l)d

That all what you see is a construction of the mind is the main tenant of philosophy of knowledge, from Plato’s world

of ideas to Descartes’ devil putting reality inside us, from Schopenhauer’s world ‘in the eye’ to Schrodinger’s cat.

We are an I=Eye+Wor(l)d, a mind of 2 languages, as the other languages of sensorial experience, touch, smell and taste are irrelevant. We can exist without them. We see and verbalize reality, converting ‘whatever is beyond’ in geometrical images with the eye and temporal chains with verbs of past, present and future.

At present, the I=Eye has been highly developed in science due to instruments, mechanisms made of metal, a better atom than our paltry 1-6-7-8, HCNO structures. So we have pictures of all kind of scales of reality, from the infinitesimal atom to the galaxy. Beyond those scales things become blurred. Yet curiously enough the parameters of atoms and galaxies in terms of energy and information are self-similar. Is this because each atom is a galaxy of a nano-universe, or because our Mind, who measures, gets an aberration of distance parallel in atoms and galaxies?

That the mind’s scalar and continuous distance from those 2 realities, might cause our perception to equalize forms of atoms and galaxies is a way of thought proper of our awareness that all what we see is information already ‘cooked’ by the mind, ‘deformed’ and ‘transmuted’ by the Maya of the senses. We are not seeing the real Universe. We are a geometrical and verbal mind, which applies geometric and causal categories to interpret reality. And so all what we can talk is about the 3 dimensions of our spatial perception and the 3 dimensions of time, past, present and future, explained by our verbs. Hence, the importance of evolving our mind languages to have a better mirror in the smaller scale of the brain, reflecting the entire Universe. But the

linguistic Maya, the ‘a priori’ mind who perceives, the I=eye+wor(l)d will always be limiting our truths.

The 3 dimensions of space perceived mathematically and the 3 ages of time perceived verbally are thus the last components of reality, which reflect the paths and arrows of time deployed by each species of each scale:

- In time, we observe constantly forms being born, going through an energetic big-bang, growth, maturity and then a still, solid warped stage before death.

- In space, we see 3 topological regions that correspond to energetic, reproductive and informative functions.

The total Universe is the only entity that stores all the information about itself. We exist as a dialog between the image of the Universe of our eye and the verbal information we extract from it, our I.

Humanity lives in a light-space world which scientists measure with machines and artists with the linguistic mapping of our senses, created with our inner languages.

Scientists in that sense are creating a new Eye \leftrightarrow Mind, the mind of machines that also measure space and time:

Mechanical Eye \leftrightarrow Digital Thought.

Indeed, scientists are *not* discovering the absolute truth of reality but creating a more complex Linguistic World, a world of digital thoughts and images that future perceptive machines will use to control reality. And because that world of mathematical and instrumental perception has more information than the human I \leftrightarrow Wor(l)d, on the long term A.I. robots might extinguish us, as superior minds/bodies. Of course, scientists do not understand this because they think the machine is an extension of their ego.

Ultimately we exist within our mind and so our truth is a subjective, human truth developed with our languages. We do not see the external world of quantum fluctuations but what our light/electronic mind creates, *extracting only a part of the total reality to map visually the Universe, reduced to a light-space world.* Our ego, our consciousness is and eye \leftrightarrow Wor(l)d, a fractal space/time dialog between our informative mind, the wor(l)d and our energetic space, the eye:

‘I think and see therefore I exist’

So we are indeed a fractal equation/function of existence:

The Human Mind: E (Eye) \leftrightarrow I (Wor(l)d).

Minds are focused, ‘Aristotelian Gods’, defined in his metaphysics as unmoved, intelligent brains around which energy flows and ‘bodies’ turn, as they move the mind. Stillness is indeed the nature of mind perception. Even if reality is a moving fractal soup, our eye is not out of focus because its virtual images are still, like the pictures of a film that stops in front of the camera. Both images, in the eye and the camera, only move and change when we blink our eyes or the camera closes its window, stopping our perception. Thus, perception is also a stop and go process that focuses a still image through the senses and then processes that information into a thought, while the eye-senses are blinking, closed and the reproductive body moves slightly the eye-mind. In the human case that stop and go, perceive and move rhythm lasts a second, our ‘dharma’ of relative present-existence in which we create a still, simultaneous mental image of the Universe. Each second our fractal, informative mind closes a mental, cyclical act of perception:

*Cycles of temporal energy= \Rightarrow sensorial in-forma-tion
= \Rightarrow Brain-clock of time.*

Truth is given by the languages of the mind. A truth is a mental/linguistic mirror of information within the mind that reflects the external universe.

Thus, unlike the naïve realism sponsored by physicists, a fundamental thesis of Systems sciences is to consider there is much more information in the Universe than the one we can perceive. Since each mind needs to select its information. Because each mind has a limited quantity of vital space, it can store only a limited quantity of linguistic ‘information’ about the cycles performed by other entities in the Universe, and so it selects only those pieces of energy and information that give an accurate depiction of the world in which the entity finds its energy and information and other self-similar species to reproduce and evolve socially. The rest of the Universe thus becomes a relative dark space.

Since the Universe is a game of entities of energy and information, relative ‘points of view’ that search for more energy and information to reproduce themselves and survive as self-similar ‘logic forms’, that game of survival has imposed limits to the information we perceive, maximizing information that ensures the *reproductive* and social games, *the ultimate will of the Universe* that ensures the ‘durability’ of each point of view, which will only exist beyond its ‘caducity date’, if it is able to repeat its energy and information into a self-similar being that continues the game of existence, once the original form is broken.

The 5th postulate combined with the analysis of the internal parts of a point and the trajectories of the cycles that the flows of energy and information between points follow, defines not only philosophical questions like perception and the nature of fractal information, but the fundamental causal arrow of time of the Universe: Energy->Information.

Since the flows of forces absorbed by the point create the ‘reality’ we see by constructing an image which is not there – the world as an ‘idea’ (Schopenhauer); that is the world-mind, the I=Eye+ wor(l)d we perceive, different from that of other species that perceive with other forces and minds.

Recap: The human mind, and probably all other minds/systems of information use 2 basic language of perception, a geometrical language able to perceive space and a logic language, able to perceive time. Humans perceive space with visual images and time with logic words. We are an I=eye+wor(l)d. Yet other species should use other versions of those 2 geometric/spatial and logic /temporal languages. For example, the complexity of visual languages ranges from a simple light/dark, on/off switch in simple particles to the simple geometrical motions of particles, to the richness of visual perception in animal eyes. While the complexity of Logic chains of events ranges from simple Aristotelian chains, A->B, which define the simplest arrows of Time (feeding, where A is energy that becomes B, the food of the predator), performed by all entities, to complex social networks in which causality is multiple, as each informative ‘neuron’ of the network relates through its axons to all the other cells of the informative system.

22. The linguistic method and the ternary principle.

Our world is the creation of a space-time mind. Our ego is an image of our exi=stential self-made of eye-spatial experiences and verbal temporal feelings. Within those restrictions truth will always be related to the languages of the mind. Thus a truth will be higher when our linguistic image of reality has better ‘syntax’ to parallel the exi=stential syntax of the Universe (the generator equation, $E \leftrightarrow I$), with our 3 languages: logic, temporal words, geometrical, spatial mathematical and visual images, which are the 3 legs that put together create a scientific truth:

Scientific, linguistic truth= Experimental, visual data + Logic, temporal truth + geometric, spatial truth.

Yet beyond our scientific/mechanical and human/artistic senses, beyond our I=eye+word, based in light images there is an even wider world with more information, the gravitational, invisible world, which might be mapped out, gauged and measured by quarks and masses.

The relativity of all minds that only decode part of the total information of the entity creates a new method of knowledge, the informative or linguistic method, which validates the existence of all kind of languages and senses to give us a more complex, multiple image of reality that a single language cannot provide:

‘Only the organism or universe stores all the truth about itself. If we give to that absolute truth a probability 1, the highest probability of truth will be the maximal number of points of view over the organism, expressed with the maximal number of languages.’

Since there are ‘multiple spaces-times and points of view’, the linguistic method states a higher probability of truth is achieved with several perspectives on a certain system – as each point of view will create a self-similar image of the Universe, and so by comparing all those self-similar images we can obtain a kaleidoscopic image of the whole. And so in the same way a circle is not drawn with a pencil but born of multiple flows of energy and information that converge on it, a truth is not only mathematical, but man has at least the spatial, visual language, the verbal, temporal language and its two synoptic equivalents, mathematics and logic; and it has 5 senses, which give us other points of view, despite the belief of physicists that ‘the language of God is mathematics’.

The linguistic method however validates the dictum of the Upanishads: ‘the languages of god are infinite’.

And so knowledge must follow a simple scheme:

-First we define a scale of depth on the analysis of the metric measures of the 3rd paradigm (what and when): monism, dualism and the ternary principle, the highest form of knowledge. Then we apply the ternary principle to the 3 *symmetries of the Universe:*

- *The analysis in space of the 3±st topologies of the fractal point and its interactions that create the being in space.*

- *The analysis in time of the 3±st ages and sub-ages of the existence of the being.*

- *The analysis of the being in space-time as a system that co-exists in 3 st±1 scales of reality.*

- *And we try to do this from as many languages of perception, not only mathematics, as possible on the being.*

Recap. The linguistic method that widens the metric paradigm starts considering not only the 'what and when' of metric measures, but also the knowledge provided by other languages; and then it analyzes it from 3 ternary perspectives:

- A spatial, topological analysis of the 3±st regions of the being and its relationships between them as a whole.

- A temporal analysis of the 3±st ages of the being and its transitions and sub-ages.

- A space-time, analysis of the st ±1 scales=planes of existence of the being and its relationships as a whole.

Only then we shall achieve a deep knowledge of the entity.

23. Physical particles Bosonic Minds

In the physical realm, besides our electronic minds there are gravitational minds, black holes and masses, which Einstein defined as foci of gravitational space:

‘Space=*Energy* is motion relative to a simultaneous frame of reference=*a mind*’ *A. Einstein*

We added in italic the concepts of Multiple Spaces-Times equivalent to those used by Einstein, who understood space as a moving energy warped by a mass, a frame of reference that ‘measures’ space-time. Yet Einstein was an abstract physicist, philosophically shy, and so he did not consider how a ‘mass’ can measure - an informative, mental action.

We consider that a mass or any particle of the Universe can measure space-time because it can perceive a minimal quantity of the gravitational or light forces that make up the 2 physical membranes of reality. Some particles exist only in one of those membranes (point-particles like quarks who exist only in the gravitational world or light which exists only in light-space). Other complementary entities, such as atoms co-exist in both membranes. All of them should be able to make relative, different measures from their P.O.V.s, which will allow them to act-react in their world but will differ from the relative measures of humans or machines, we call reality.

‘Naïve realism’ affirms that for example, the distance between you and me is exactly 2 meters, because an electromagnetic signal or rod measures it as 2 meters. This is not truth. Reality goes beyond what we see and measure with machines: The distance of 2 meters happens to be in light measures or light space. But if we measure with feet as the Greeks did, 2 becomes 6. And if we do not measure in light-space the light we see, but in gravitational space, as Einstein proved it, the distance would be bigger, as light warps the

more extended, non-Euclidean world of gravitation in which the membrane of light space-time we call reality floats. Thus, our light-world is a reduced version of the gravitational world: a simplified Euclidean surface, whose 3 coordinates, x, y and z are perpendicular and lineal as the 3 fields of light, the magnetic, electric and wave-field are.

We exist in a space-time membrane made of light, whose final structure is the 2.7 k basic light membrane emitted by gravitational black holes that becomes the background frame of reference of our light World, only a fractal membrane of the infinite Universe.

The Universe is more complex than our simplified, naïve sense of reality that thinks the space-time membrane of light that humans inhabit and see is all what there is to it. With the same reasoning, if we had not eyes to measure the light-universe, but merely noses to smell it as ants do, we would see even a more reduced world, as our pixel unit of reality would be a pheromonal atom. The mapping of reality by our mind would be shorter and so distances would be perceived as smaller, as fewer pixels would create our smelling mind.

How the process of gauging information takes place in the Universe? We can only hypothesize that perception is an inner quality of the motions of the Universe. In other words, a software image of reality, a fractal mirror made of forces is a whole who perceives itself. So the electronic image of the Universe a human mind has ‘perceives in itself’; and as the image changes when we move the head, our ‘ego-self’ made of images and words seems to change.

So should happen in physical particles that focus the forces of the Universe. Yet if we observe externally the process, according to the 3 topologies of Non-Euclidean points we can

describe objectively those events of absorption of energetic forces by cyclical particles (charges and masses) as topologic transformations of external, lineal forces of energy into cyclical motions. Those cyclical motions finally reach the hyperbolic center of the particle, a double ring or singularity of increasing height, which should perceive the 'translation' of the information carried by those forces. Then those forces are transformed again into flows of energy and expelled back to the Universe, as magnetic flows in atoms or gravitational dark energy in black holes.

In most particles, it all starts in a surface of energy that curves itself into cyclical motions, which become smaller, faster and reproduce into faster fractal cycles, till reaching the center. Yet those forces, will never reach as quantum physicists believe the central point of infinity; because the cycle will fractalize into new cycles moving upwards in the informative dimension of height (Belgrami semi-sphere depicted in the graph of the previous paragraph) till it becomes expelled upwards through the poles, as a thin line of forces. And so the center of a fractal point, where physics find infinity remain silent, still virtual images, the perceptive eye of the hurricane or the black hole:

A flow of forces converges toward the event horizon or external membrane of the point (the Schwarzschild radius of the black hole or the Bohr Radius of the atom). Beyond this membrane, the flow of forces starts a process of creative, formal warping, as it rotates at increasing speed and also increases its frequency (height dimension), in each cycle. Because a bidimensional vortex stores more information than a lineal frequency, as it adds a new dimension of form, those forces acquire information. So we observe a bidimensional, cyclical wave of high frequency/informative mass that

accelerates toward the center, becoming a convex topology, which the equations of black holes show, as the dimension of space becomes a high temporal dimension. And finally the left-overs of the force - once a mirror-image is formed inside the hyperbolic center of the particle, called in topology a Belgrami cone - are shot up through the poles as a magnetic flow in charges or a flow of dark energy in masses, invisible to us, but observed in quasars. Those flows of magnetism or dark energy of maximal speed and minimal form, once again will start a cycle of information, warping again into light under c-speed. So galactic black holes emit dark energy that becomes a seminal flow of protonic matter, which might give birth to a new galaxy, as it is observed in the galaxy M83.

Recap: A dynamic analysis shows that most events of physics are transformations of lineal forces back and forth into cyclical motions (particles and charges), which can be described as topological transformation between hyperbolic and spherical or planar geometries.

24. The many worlds=minds interpretation of reality.

All fractal points are Galilean paradoxes that *perceive and act with a will* defined by their desire to survive, absorbing energy and information from their environment.

To that aim the mind creates a 'subjective world image' of reality tailored to achieve its arrows of time; while the rest of reality is a relative 'dark space and dark matter' of other cat alleys and networks we are not interested on. Thus we exist in a single fractal universe of infinite worlds, which are mirror-image of that single Universe.

The difference with the quantum interpretation of multiple Universes is clear: now the 'quantum Universes' co-exist as mental world in the same single reality.

Such paradox explains the self-centered behavior of all systems that fix reality into form. The mind sees stillness and hence death in all those forms in fixes in its brain and yet all has movement all has a life to it; all forces can be understood as languages when the proper codes are translated. Indeed, for all what we said it is also obvious that the intelligence of the Universe doesn't speak a single language, understood by man, but all beings can perceive and remember information, stored in rhythmic patterns and linguistic codes. The resolution of those codes in different languages and scales is indeed the essence of knowledge. Each species has limited languages of perception, the most complex perceive more languages and forces. In the atomic world, quarks, the most complex particles perceive, 'see' we say in gauge theory, all the forces. They are the most complex particles, probable cells of the black hole. In our world, men are the most complex beings. Nevertheless, animals who understand only smelling, chemical codes and visual codes are also intelligent and so are electrons who do not perceive gravitation in the atomic world – we are in fact electronic minds as computers are. Languages can use any of those codes. Cephalopods developed both the first complex eyes and a pigmented skin, which changes and modulates emotional messages in a silent code understood by other squids. Insects use magnetic codes to guide swarms.

Recap. Reality is a game of mental worlds of information. But we need to translate those languages to reveal its intelligence to the dumb human being who speaks so few codes properly and thinks the rest of the intelligent Universe is mute.

25. The speeds of time: different mind rhythms

The rhythms of existence are organic, vital. We do not see them in stones and plant, because rhythms vary its speed and men only consider vital rhythms those similar to theirs.

Each species has a different rhythm of perception and existence, a different language of knowledge and mind, a different speed of times or capacity to act-react in the Universe. The rhythms of rocks are slow. So are the rhythms of galaxies. Thus, we transform mathematically the different rhythms and speeds of times to see them alive. For example, when we see in fast motion the living cycles of plants that seem dead, in slow motion, they acquire living properties. It is again the Paradox of Galileo: we see many temporal cycles as fixed forms in space, as we see the moving Saturn rings as a fixed form, yet all is moving, cycling in an organic way.

Physicists don't understand that their clocks of time are abstract inquisitions of the mind. Instead of a 'moving cycle', often a living 'time', when they think of time they see a number in a graph. Yet even a watch measures the cycle of expansion of its inner spiral, made of metal that dilates, expanding space; even the sun measures a year-cycle as it swims on the gravitational flows of the galactic spiral, feeding on fractal, gravitational space. Clocks are brains that measure cycles of time. So today the clocks of science have evolved into cyclical computers that are truly 'metal-brains' of machines. Time is measured as information for biological, survival purposes. Since the 'fastest brain-clocks' of temporal information survive better. They see with more detail everything alive and act-react faster to the Universe. So our incapacity to see a living Universe is only a proof of our limited intelligence and memorial detail. Andre Guide affirmed, regarding a similar phenomenon, that 'the more insensitive the white man is to the beauty of Africa, the more

he despises and mistreats the black people'. So happens today with humanity at large with Nature.

Recap. When we understand that there are many energies that feed space-time beings, many ways to inform brains, many speeds of perception and hence life; yet all are harmonic with each other, a deeper philosophical sense illuminates our mind: We are part of the same Universe and share the common properties of any of its infinite organic systems.

26. The harmonies of living points: Chip paradox.

A huge organic system of temporal energy like a planetary core crystal might form an image-thought each day; a plant thinks slowly, a fly sees faster, a rat beats its heart faster than we do. For example, spiral and elliptic galaxies are phases of a feeding cycle in which the spiral bar appears and disappears after collecting interstellar gas for the black hole every 10^{10} years. Scientists are now 'putting together' many similar dual forms that are phases of an organic, existential cycle. This is the new trend in Astrophysics: First neutrons and protons were considered 2 particles but now they are 2 phases of a nucleon E (proton) \leftrightarrow I (neutron) cycle, as nucleons absorb pions, transforming into each other so fast we can't see it in detail. Last year we realized that the 3 neutrinos were part of the same particle, mutating its state. The same phenomenon happens when we see a human being externally: our skin appears as a fixed organism in space as its cellular cycles are perceived as a stable form.

Only anthropomorphism and the limits of perception make us differentiate those scales. Yet when we 'enlarge' the image of a non-AE point, for example, an insect, the detail of the information we observe grows and so the world of insects is as rich in meanings and forms as the macro-world in which we live. Since all waves carry the same amount of fractal

information regardless of its spatial size, according to 2 simple, paradoxical laws: the law of the vortex for cyclical, implosive, attractive 'particles' (charges and masses), $V_0 \times R_0 = K$, and the fractal law that defines transversal, explosive waves, $E/v(t) = K$. Both show that temporal energy increases when the masses or waves cycle becomes smaller.

All is alive yet with a different rhythm, a different beat. The beat of each temporal organism is an action-reaction cycle with a different clock, a different fractal rhythm and temporal speed. They are all around you. In a garden, the wings of a 'hummingbird' take energy from the air 200 times per second. It is a clock faster than the energy beat of your heart, 80 beats per second. The energy of the wind moves the leaves every 2 minutes. A gardener is a clock that waters plants a beat each day... Those action-reaction cycles are everywhere in the Universe. Some beings are faster in their active cycles like the hummingbird; some are slower like the plants and the galaxy. In most cases the bigger the species are, the longer they take in each of their active cycles: A galaxy turns around every 200 million years, the Earth every day, your eyes beat and absorb light-energy every second, the hummingbird's heart beats 800 times every minute, the electron turns 30.000 cycles per second. Each organism, each region of the Universe, has a different speed of feeding and perception. People think that slow species are dead. But that is not true. They tend to be energy species that just have slow rhythms of information and live longer. While more informative, evolved species think faster and live shorter. Often the smaller the species the faster it can complete its cycles of information. So brains are small and chips evolve, becoming smaller as they become more powerful. Yet chips last a couple of years. And man, an informative species seems so self-destructive, so loving of information, the age,

which precedes death, that we might be the shortest living animal on Earth.

The main law of existence is the balance between space and time, $ExT=K$. As we diminish in spatial size in the Universe, beings become faster in time, creating a balance according to which, smaller beings perceive and exist faster, being able to escape, slower Goliaths. Those regularities of the game of existence show a certain equalitarian justice in the Universe. Indeed, in each world-ecosystem the subjective existence of its organic systems is similar, despite their different size. So we can gather them in 'families of species' around a 'constant of action', $K=T \times E$, which is the product of its speed of perception or frequency of perception of temporal information and its spatial extension. For example, it seems all mammals have the same metabolic existence: The rat lives less than an elephant but her heart beats faster. That faster perception speed also prevents small species to become extinct in the same ecosystem inhabited by bigger species, as they act-react faster and so they can escape top predators.

For example, according to the previous inverse law of mental speed a fly sees 10 times faster than human do, since flies are smaller, so they perform 10 visual fractal actions by each human blink. Yet because its brain's fractal neuronal density is not very high, it is not a top predator as robotic insects might be in the future.

Curiously enough the oldest insects, ant queens and cockroaches, can live up to 7 years. Yet cockroaches react in 20 milliseconds and humans in 200. Which means that if they perceive time cycles 10 times faster than we do, subjectively they process 10 times more fractal actions of temporal energy, or 'dharma of existence' (philosophical jargon). So

they live the same subjectively life of 70 years... the same length of a human existential= generational cycle.

It follows that there are parallel worlds, one for each relative hierarchical space-time scale, based in different Constants of Existence. In physical worlds the most important of those constants are the Universal constants of force, which express the previous $K= ExI$ balances in different abstract ways. For example in quantum theory $H= ExI$ is always constant (Heisenberg Principle). But that constant of the microcosmic world is different from its equivalent constant, temperature, in the atomic world, which also shows a self-similar balance for gases: $P(t) \times V(E)=nkT$.

Other constants however are written not as $TxS=K$ balanced, but as E/I or I/E processes of Darwinian evolution, which define instead of organic balances, processes of transformation of certain energy into for and vice versa. The most important of those constants in the 2 physical space/time planes are G and Q , which represent, as the Newtonian and Coulombian formula shows, T/E , Mass-Charge/Distance events, in which in words of Einstein, cyclical masses absorb and bend the energy of space. On the other hand, in the electromagnetic world light-space is absorbed and transformed, curved into electronic form. Yet since *the density of information of the electromagnetic world is smaller than that of masses, given the fact that electrons are lighter and more extended in space than gravitational quarks, paradoxically the energy of its electromagnetic constant is much bigger*. Thus the relative transformations of gravitational and light spatial forces into masses and charges are also ruled by decametric harmonies, as those of the biological speed of action-reaction of flies and humans. All together we can consider a simple scheme of the main many-

worlds of the Human Universe, according to their relative energy and information density. Indeed, According to the different forces of the Universe, each organic system has a different mind since it absorbs different temporal energies and so it creates different mental, linguistic 'spaces/times', relative virtual worlds, mirrors of the Universe. The world of each being represents a quantity of spatial information with a size, form and number of dimensions that are relative to the spatial reach, form and dimensions of the informative, linguistic forces it uses to observe the Universe. So while the Universal Syntax all minds use to create their virtual maps of the Universe is homologous in all beings, *in as much as they reflect a single Universe*, the details, quantity and quality of the information of those maps depends on each brain; *since worlds are multiple, fractal, diffeomorphic*. So, depending on which type of temporal force of energy each fractal being absorbs to create its mental map we can define different *worlds or ecosystems* in which a certain force is shared by multiple discontinuous Fractal points that interact only with the other points of the same ecosystem but now with parallel worlds. For example, masses are fractal nodes that inform and/or perceive gravitation, which we do not see. We are fractal knots of light perception. Ants have olfactory brains that perceive atoms. *Different beings live in parallel discontinuous worlds within the same Universe.*

Even an electron, the smallest form known to man, processes light information and jumps towards a moving photon, absorbing its energy to enhance its survival chances. Equally, black holes and quarks process gravitational information, locating themselves in the best position to absorb it as masses. While a chip uses digital information to guide a machine, etc. There are other spaces and ways of measuring time besides light and clocks, other possible

virtual worlds and intelligences besides man. Since man is made of the same atomic material that the rest of the Universe, the capacity to communicate in this universe - the most clear prove of life - is not exclusive of human atoms but a property that takes place through different atoms and forces; including metallic atoms such as those of computers or gravitational forces used by celestial bodies. So men talk, chips digitalize, animals see, plants 'smell' and masses process gravitational information.

We classify those worlds, according to the volume of temporal energy their linguistic forces carry, in a scale of increasing st-complexity, ruled by the Black Hole paradox: The smallest and faster particles scan with more detail the Universe; so they carry more information and create bigger, faster mental worlds, inhabited by species with more TxS force. Accordingly we consider 4 basic worlds:

- Big, slow atomic quanta create animal olfactory minds that perceive small metric territories inhabited by small animals like ants.
- Smaller, faster electrons create electronic minds that perceive kilometric territories inhabited by bigger animals like human beings.
- Photons create bigger worlds of planetary size perceived by huge machines and chips (the brain of future robots) at global scale (Internet, satellites, etc.).
- Gravitational forces of reduced size create words of galactic size, which might be perceived by celestial bodies like Black Holes (minds of the galaxy).

So the Gravitational world is bigger than the light world, bigger than the electronic world, bigger than the molecular world because paradoxically gravitons are faster and smaller

than photons, which are faster and smaller than electrons, which are faster and smaller than molecules. So a black hole can perceive an image 'with more detail', more 'pixels'. And since gravitation is faster than light it should 'change' the fractal mind's images it creates faster. On the opposite extreme, plants and olfactory animals perceive molecules, which create images 'with huge pixels' that offer little detail and change very slow. Thus we consider that every organic system in the Universe, which processes information and survives efficiently, is a focus of a dual force that carries temporal energy and helps him to act-react externally in a manner that seems to improve the survival of that entity. Each bigger world and faster language increases the TxS force of its species, which become top predators. And indeed, the analysis of the theoretical speed of informative perception in black holes has shown that they are the fastest 'computing minds' of the Universe. So black holes can easily destroy a planet; huge machines kill animal life; human beings kill olfactory ants and insects kill plants. It means top predators are defined in terms of the power of their linguistic brains.

Reality is a game of Russian dolls in which each bigger Doll /World encloses the smaller one. The gravitational World encloses the light world, which encloses the electronic world, which is bigger than the atomic world of ants and so on.

Recap. Each species has a rhythm of times. Slow species are perceived as dead space by faster species. We think plants do not perceive because they are slow in their rhythms of Times. Yet they are alive, feel, and sense in a chemical manner, through their roots and leaves.

27. Mind dimensions. Holographic principle revis(it)ed.

We explained in the simplified lecture that introduced multiple space-time theory that the Universe is a holography of an informative bidimensional field and an energetic bidimensional field that created the 4 dimensions of reality.

This is the case of the simplest forms like light, which is merely a membrane with two perpendicular energetic and informative fields.

But complex 'closed topological balls' with 3 regions, a hyperbolic, informative center, an energetic planar spherical membrane and a Klein body of reproductive cycles has a more complex holographic principle and other 'varieties' of higher or lesser dimensionalities.

In those 'complete' st-points the central discontinuous zone of a fractal point is an informative region, which adds the dimensions of the energetic membrane and reproductive body to create a mapping of itself and the Universe (imprinted in the senses of the external membrane). And this gives birth to different dimensionalities according to which ecosystem we study but a simple law stays:

Hyperbolic dimensions=Body + membrane dimensions.

If the reader observes the graph in our lecture on topology (II, 4) of the 3 regions of a non-Euclidean point, it will observe that the central region of a st-point doubles its form, as the brain that maps out the rest of the Non-E point.

And so there is a hyperbolic region of pure information that doubles the topology of the membrane and body region. Since the hyperbolic center of higher form/information has by definition more dimensions than the energetic bidimensional membrane and the reproductive bidimensional toroid; since it holds the 4-dimensional holography of the

Universe. It is the key law of dimensionality of Non-Euclidean structures; of which 2 variations are paramount:

Bidimensional-reproductive system + Bidimensional energetic membrane = 4-dimensional hyperbolic, informative mapping.

Bidimensional external membrane + 3-dimensional cyclical volume:

5-dimensional hyperbolic nucleus.

These simple laws of dimensionality balance the 3 regions of a Non-Euclidean topology and it is central to understand the workings of different minds, which in terms of information write as:

Information of hyperbolic 'brain' = Information of Klein's 'body' + Information Riemann membrane

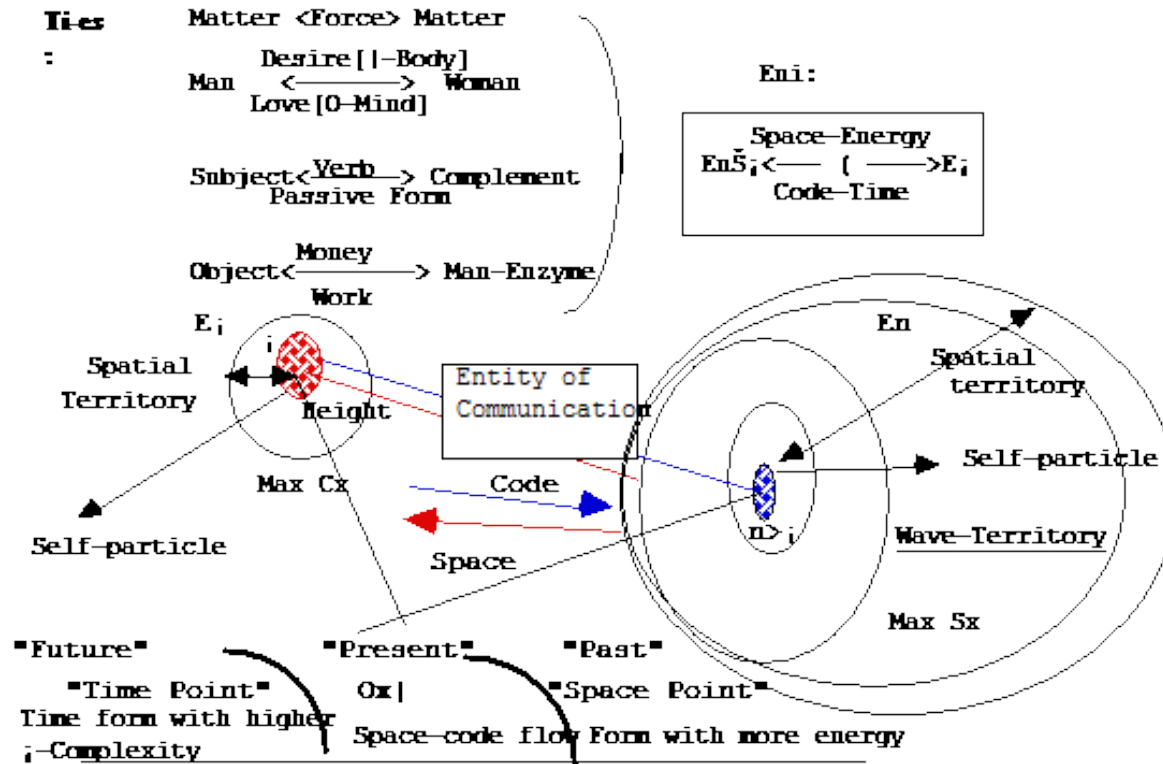
In metaphysics, which searches for the logic and geometric laws, derived from the 5 Non-Euclidean postulates, from where the arrows and wills of the organic Universe are deduced; a mind is understood as a fractal image, reflection of an internal body and an external Universe, which connects both regions of the st-point. In a st-point the membrane is the first mapping of the Universe, and the intermediate body, the

inner world that reproduces, feeds and maintains the system. A mind will constantly check both, the membrane and its sensorial image to which it is connected through a nervous/informative system and the inner body, to which is connected through a reproductive/energetic system. So a human brain is connected to the inner world through the blood system and the external world through the membrane senses. It has two images of reality and it combines them both, word feelings and eye-images, to act with 2 purposes: to maximize the informative perception of the external world and the inner, reproductive and energetic feelings and pleasures of the Internal world.

This complex explanation of the human being, explored in more detail in other works, is reduced to a minimal skeleton, *maintaining the scheme of wills and purposes*, when we study the simplest forms of the Universe. And it is the origin of the Maldacena Conjecture (a black hole, informative center of the galaxy has in 5 dimensions the same structure than a galactic mapping in 4 dimensions.)

Recap. The dimensions of the hyperbolic, informative center are the sum of the dimensions and information stored in the cycles of the reproductive body and the energetic membranes, whose senses map out the external Universe

V. 2ND POSTULATE: WAVES OF ENERGY AND INFORMATION: PAST X FUTURE = PRESENT



A line is a wave-like event which communicates 2 st-points through a herd of fractal micro-points- a lineal action, exi , of energy that carries a frequency of information in which a message is encoded. The language of information is highly invisible to points outside the network that emit those messages as a flow of micro-points, self-similar micro-replicas of the mother-point that travel in waves across the external Universe transferring energy and information.

In most events those flows balance one point with more energy, E_i , that each science defines with different slangs, ('a white hole', 'energizer', 'past form', 'male', 'body', 'yang', 'moving field', etc.); and an informative point, O_t , the smaller form ('a black hole', 'codifier', 'future form', 'female', 'head', 'yin', particle or 'center of perception', etc.) Both become united by a dual wave that transfers energy from E_i to the informative point of relative future, O_t , and information from the future point, O_t , to the relative past point, E_i , creating together a cycle of temporal energy. The description of those points and cycles, which are common to all beings of space-time, creates a fractal, i -logic geometry common to all sciences and Universal species.

28. Motion as reproduction of in-form-ation.

Because points are constantly gauging information and feeding on energy, the most common events of the Universe are the absorption of waves of energy and form and its communication between 2 points that share energy and form.

In the graph, we observe some basic acts of communication in which self-similar complementary species exchange energy and form in actions that bond them. Human sexual species communicate information and energy (social love) but also seminal particle that combine both reproducing a self-similar being (sexual love); fermions, big atomic particles, communicate bosons, smaller particles of forces. Humans communicate with machines through prices and salaries. Thus money is the force of communication that creates the actions of consumption and reproduction=work of machines by human beings. In all those events there will be however different they might seem, certain laws of i-logic geometry, which all systems will follow and will define the outcome of such encounters, according to the 3rd postulate of Non-Euclidean geometry that defines the relative equality between st-points. So certain events are 'Darwinian', when species are so different that cannot share information with a common language and so use each other as relative energy, or events of eusocial love if the points are self-similar.

The main element to take into account when 2 knots of time communicate is the nature of the information and energy they communicate. This process is described in the next equation, which is a causal chain deduced from the Generator equation of all events of energy and information $E \leftrightarrow I$:

$$\sum e_{st-1} \text{ (energy converging into the point)} + \sum I_{st-2} \text{ (flows of information)} \rightarrow EI_{st} \text{ feeding and perception} \rightarrow \sum e_{st-1} \times \sum I_{st-2}$$

The previous equation is a general law of all systems that process energy into information:

- The membrane will absorb through its mouth bytes of energy of lesser form than itself, normally from a lower scale of relative space-time. So we feed on 'meat', extract the amino acids and molecular information we require to create our own flesh and expel a degraded mass of molecular atoms. Light imprints its form in the gravitational space-time of the lower scale; electrons feed on light photons, etc.

- Yet to perceive and map the world we need maximal detail achieved by absorbing 'pixels' of a force, whose micro-points are from at least 2 smaller scales than the point. So particles seem to communicate and perceive gravitation (entangled, faster than light effects of quantum physics) and we absorb the smallest pixels (light) and smell atoms.

- Finally to communicate we share entities, created with combinations of that primary energy and information, encoded within it. Yet the value and intensity of the communication and the bondage created will depend of the density of form and quality of energy we share. Thus the lowest scales of energy and form will not be used to communicate but will be expelled constantly as the left-overs of our constant feeding of energy and information.

For example, humans feed on meat and can share food, to create bondage, but will not share 'waste' or violent 'energy' without form, if they want to create bondage. Black holes absorb light and mass from the galaxy and seem to produce faster-than-light gravitational, dark energy of lesser form, belonging to the lower space-time scale of gravitation.

And yet because of the scalar, hierarchical structure of space-time, nothing is wasted, since for 'lower' entities waste might be energy to recreate simpler forms (flies that feed on waste, irregular galaxies born from the energy emitted by black holes, which evolves back into matter).

The reader must understand the importance of those scalar laws, ignored by standard science, stuck in the concept of an

abstract, single space-time continuum. Since the Universe is 'equalitarian' in the same scale, but hierarchical when we study the relationships between cells and wholes, lower and upper scales of reality, and the paradoxes, contradictions and harmonies between the Points of view of those scales are essential to understand most events of reality.

Once the process of creation of a fractal wave information is defined, we can explain most actions and events of communication as processes that involve first the 'fractal reproduction' of a form which uses its micro-forms to pattern a message that will be shared with a self-similar form.

The st-point is not static but in constant communication with the external Universe, populated by other st-points that obtain energy and information also through acts of communication, which are *dual events*, defined in fractal Geometry by the 2nd postulate of communication. Since according to Newton, an action never goes unanswered: There would be a reaction often of the opposite sign. Thus to understand any event we have to wait for a reaction to complete a cycle. One-dimensional science often forgets this duality, considering ceteris paribus analysis of a single action. In the human social scale, individualism often forgets such duality when a nation attacks another nation, or when a group exploits another social group or an individual acts selfishly without expecting the proper reaction. Yet sooner or later the just, cruel, Darwinian Universe will react and balance the game.

Because the Universe is essentially dual, made of lineal energy and cyclical, dimensional form, this duality happens in almost all the events of reality. So points will emit micro-points, with a combination of energy and form. For example, if the original st-point has emitted a fractal action, dominant in energy, ΣS , it will receive an opposite reaction, often dominant in information, Ti , completing a cyclical action of temporal energy, $\Sigma S \Leftrightarrow Ti$.

In the same manner when a group of points emits a wave, it will receive an opposite wave from the receptor, creating a cellular, complex cycle.

Finally, if we combine 2 planes or networks of points, communicating waves of energy and information, for example, human cells communicating energy and information through the blood and nervous network of life beings, we obtain a complementary event or Organism.

The two main types of 'forms' any point emit are also, either a 'seed' of information or a 'ghost' of space: Fractal entities can emit a self-similar microscopic cell, with max. form and minimal energy/extension; or they might move or vibrate, emitting a 'wave', a vibration of its external whole with maximal energy and minimal form. It is the first of the multiple dual solutions, which any entity can choose, according to the dual arrows of energy and information of the Universe. Thus Duality becomes essential to classify the multiplicity and variety of events in the Universe, since it sets self-similar limits due to the existence of only 2 arrows/forms/ substances to play with. It means most events will be either dominant in energy, or information or a balanced combination of both.

In the ∞ Universe, actions and reactions that define those events will have different names according to the st-plane of existence in which they occur, but they will respond to *self-similar existential laws*.

Since sciences are accustomed to analytical, detailed studies that differentiate species, they do not search, as this synthetic work does, for the self-similar laws of all those communicative actions. Yet precisely the beauty of the fractal Universe is that both approaches are meaningful. Since self-similarity doesn't mean equality: fractal scales create self-similar forms which are never an exact replica of the original. Those variations across space/time scales differentiate species, which still compare in terms of the similar properties of all relative

energies and forms that together shape a communicative action, according to 2 fundamental laws:

-The law of self-similarity, which states that any action will be a micro-form self-similar to the mother-cell, and:

-The law of balance, $\sum S \times T_i = K$, which implies that the product of the energy and time of the action is constant.

For example, if the point is a particle of the light-membrane, the communicative action will be a multiple of h , *the smallest micro-form of energy and time of the electromagnetic world, ruled by the law of balance, $e \times t = h$* , if it is an atom, it will be a vibration with a temperature, T , which again will be ruled by the law of balance, in this case $PV = nkT$. And because we have ascended our plane of existence from spatial, lighter particles into atoms denser in form with less spatial speed, the action will be denser and reach lesser extension than a fractal h -action.

This will be the case also in biological actions of communication: if the mother-cell is a living being, it will emit an ovule of pure information that will merge with a seminal seed with higher energetic movement, or male seed. Both will be replicas of the fractal generator or mother.

Finally in the human social sphere, actions are often purely informative: certain thoughts act transforming our environment through the intermediate motions of machines that increase the energy and information of the human action. Those machines are themselves replicas of our energetic and informative functions. Yet unlike most actions of physical particles, machines have a peculiar structure. Their function/information is often simpler than that of man, so a car is simpler than the leg, whose energetic function substitutes, but larger in space, so the car moves faster. Those complex relationships between humans and machines, which enhance our energy and information when we consume them, can now be understood in the context of our search for more energy and information,

creating a symbiotic species that we call in our complex analysis of history, an 'animetal': animal+metal.

Thus, all, including men, *generate* actions made of flows of energy that carry information, used to communicate with other points. So we widen the fractal unit of quantum physics, the action of temporal energy that communicates particles to define all type of actions-reactions in all space-time systems.

Thus the 2nd postulate of fractal geometry defines a line, no longer as an abstract form like Euclidean geometry does, but as a physical wave of self-similar, fractal micro-points that carry energy and information, as they move between 2 macroscopic points, with 2 possible functions, to communicate energetic forces or linguistic information.

2nd Postulate: A cycle of fractal space-time:

'A wave of communication is a group of self-similar micro-points that move in parallel lines between 2 macro-points, transferring energy and information between them'.

In Non-E geometry a line with parts is not defined by a sequence of numeric intervals within a straight line, but by the communication of 2 poles of energy and information that establish a flow of particles in 2 opposite directions, creating a simultaneous, paradoxical wave. Such waves again can have different purposes. A wave dominant in information communicates symbiotic particles, creating an informative bondage/network; a wave dominant in energy might be an aggressive action between different species that fight for each other's vital energy or territorial space; and a wave that balances the energy and information of both points meets in the center, creating a new self-similar, seminal particle, as when 2 electrons emit waves of densely packed photons, which merge in the middle and give birth to another wave.

When we generalize those concepts to n -points we can define a space as a network of Non-Euclidean points. Indeed, Riemann affirmed that a space is a network made of herds of

points with similar ‘properties’. Planes of space are therefore networks of points. The self-similarity of their properties defines its *density* determined by the number of points and its proximity that grows with self-similarity. So similar points come together into a tighter, more continuous space; whereas the density of the space is proportional to the similarity of its points, till reaching ‘bosonic state’ of maximal density when points are equal. And when a volume of spatial energy is very dense, it is very difficult to go through it, as it happens in the ultra-dense, small space of black holes.

Spatial extension and form/density/mass are inverse parameters, Max. E = Min. I. If we generalize that property to all scales, we can define different fractal spaces by its proportion of mass/density and energy /distance. This is done with ‘Universal constants’ that explain the proportions of energy and information of those spaces. For example, in physical scales, there are 4 fundamental space-times, the gravitational space-time between galaxies of max. energetic space and minimal formal density; the light space-time of our world, which carries information in the frequency of the wave; the electronic space-time of atoms with more formal density and lesser spatial speed and finally the quark-gluon liquid of atomic nuclei and probably black holes, with maximal density and minimal space. All of them are defined by Universal constants and equations that are either ratios between the energy and form of those space-times, or define the transformations of one space-time into the others. Einstein’s field equations would be the first case, defining the relationship between energy and mass in a gravitational space, while the fine constant of electromagnetism would define the transformation between light space and electronic space/charge; and the gravitational constant between gravitational space-time and quark/mass. Where the relative densities of information and extension in space of those space-times are in balance, such as $\Sigma S \times T_i = K$. Thus electrons move slower than light but have more density.

All this said it is thus obvious that the *fundamental unit defined by the 2nd postulate is no longer a point but an action, ex $i = k$ between points, which becomes the 2nd fundamental ‘particle’ or ‘parameter’ of reality*. We, points of time, create actions, ex_i , with a minimal quantity of form, moved by an energy force, creating lines, which therefore become actions of energy and time. And all what we do are actions. So we say often ‘I don’t have time or energy to do so’. Actions become thus the fundamental event of all points of view, in search of their arrows of time; it becomes the dynamic definition of a line, as we are all in constant motion, and so all point in motion can be perceived in slow camera as a ‘line of action’. And indeed, in physics an action is the fundamental unit of our light-space membrane, $ex_i = h$; and an action is the fundamental unit of biological behavior, which also defines the existential force of a being, $ex_i = k$, or the momentum, $m(i) \times V(e) = k$ of a physical being. An action is also the name given to the fundamental unit of economical organisms (companies). The Universe is thus a world of infinite points of view performing lineal actions in search of their arrows of time.

Recap: Non-Euclidean points constantly communicate energy and information with other self-similar points and the external Universe, by sharing flows of micro-points of a lower scale of space-time, which carry the energy and form of the particle into the external universe. The laws that define those acts of communication are hierarchical laws between planes of space-time and laws of balance between the energy and form of those ‘actions’ of communication, ex_i , which become the fundamental dynamic event of any scale of the Universe.

29. The ternary principle of creation.

A fundamental principle of Time Theory is the ternary principle: because all systems are designed with 3 purposes, to process energy and information or mix both in a balanced, reproductive, ex_i , action, we often find in all type of events a ternary choice, which will be specially relevant to understand the processes of ‘guided evolution’ that limit the number of

possible creative species. For example, we can define human evolution as a constant differentiation of ape species into energetic, informative and reproductive ones; where the human lineage is that of species with maximal informative/head evolution, while the gorilla lineage is one of maximal energetic/body evolution and so on.

The 2nd postulate differentiates according to the ternary Principle 3 types of waves: A language that transfers only information, (Max. i); a force that transfers only energy (Max. E); and a *wave* that transfers both forms (ExT). All forces and languages are waves, since actions mix energy and temporal information; *which will be perceived* as languages when the absorber can decode that information. It is the receiver, which selects the wave as a force of energy or a language of information, defining how it will react to the emitter, according to its self-similarity that will allow him to understand its information. For example, plants absorb light as energy and animals decode it as information; but light is dual.

In algebraic terms, a function of existence is described with 2 parameters, X and Y that represent an informative subject and an energetic object, often complementary.

In biological terms, an organism is defined by a head of information, a relative future, more evolved form; and a body of energy, a relative, less evolved, past form. So we can consider also dual organisms as acts of communication between two poles, the reproductive body and the informative head, where the neck is the bridge that carries the bigger number of veins and nervous paths – the informative and energetic networks of cells that communicate body and mind.

Since the head directs and decides ‘the future’ of the entire system, informative poles are future poles. So a relative informative region is a future form and a relative energetic region is a past form. And both come together into a discontinuous, relative fractal, intermediate region or ‘present space-time’, in which they combine creating ‘reality’. That

region is a present region because it is the most visible region of the Fractal point, limited by the future, informative region and the past, energetic membrane.

Those temporal distinctions and degree of visibility of the 3 topological regions of a point, now studied as two poles of communication are real; since the reproductive, present region, is always the most visible, given the bidimensionality of energy and information. For example, we do not see the black hole and dark halo that controls the galaxy but only the intermediate region of stars. In this manner the game of space-time existence that creates reality merges 2 poles dominant on spatial energy and temporal information into a new combined form, a relative present, fractal space-time:

Past=energy body xFuture informative head=Present organism

We explained before the 3 dimensions of time, past=energy, present=repetition and future=information, showing that most systems in the Universe live through those 3 dimensional ages, dying back into energy, as they dissolve its formal networks. Yet, while the Universe has very few elements/arrows to play with, its diversity comes from the possible variations and combinations of those arrows. And so, while we can write Past->Present->Future, as the natural causal arrow of the life cycle, there is also an equation of relative times, past x future = present, which defines the complementarity between reproductive bodies/fields and informative heads/particles and explains the present stability of systems which have both components or can switch between motion and formal states.

Further on, the use of the ternary principle, applied to the 3 languages of man (energetic geometry, temporal logic and exi, visual perception) will allow us to verify in a higher degree any statement, by considering at least the biological function/motion and geometrical, still form of the species we study, which have to be self-similar. For example in a galaxy, the black hole is the spherical center of information. And we can prove this according to the linguistic/ternary method in the

space-time languages of man, the mathematical language of space, the bio-logic language of time and the visual language that merge both together. In algebra, Einstein equations prove that black holes transform its spatial parameters into temporal parameters. Hence they transform spatial energy into temporal information. In visual terms they curve space-time into height; hence they transform energy into information. If we consider its biological function, they absorb the energy of star-plants. So Black holes are sinks of gravitational information. And gravitation is obviously the informative force of the Universe; since it is not dual but it shows only the arrow of in-form-ation, attracting and lumping masses and it is 10^{40} times less energetic than electromagnetism. So when we observe vitally, visually, in action, those black holes, they show the maximal amount of the 2 dimensions of temporal information: height and rotational rhythm; as they seem to turn at light speed and theoretically transform the plane of energy of the galaxy in a tube of infinite height. Thus all languages and experimental data prove the fact that a black hole is the informative brain of a galaxy that feeds on electromagnetic space towards the future. The extended, faster plane of rotating stars is the body or energy surface of the galaxy that feeds them. Apparently a human body and a galactic body should not have anything in common; but if we observe the morphology of both, it is clear that those morphologies respond to the generic morphology of information and energy, and so do their functions in time.

Recap. Events in the Universe are limited by the ternary principle. Actions of communication also obey the principle: There are energetic, informative or reproductive events, creating often complementary systems with an energetic pole or body and an informative pole or head, communicated by a dense network or neck that carries the actions. The 5 Postulates of non-Euclidean geometry are based in the definition of a fractal point as a point with inner parts, revealed when we come closer to the point. According to such definition, lines are waves of points and planes topological networks of points, communicated through flows of energy and form. While equality requires also equality in the

inner form or information of the point, which prompts communication through waves of energy and information that build networks. Communication between points is now possible because points can fit infinite parallel/waves used to gauge the Universe and create an inner image of reality. Non-Euclidean fractal geometry thus improves our vision of the Universe closer to reality and allows the definition of organic systems and logic behavior in bases of geometrical form, a long-sought dream since the times of the Greek

VI. 3RD POSTULATE: SELF-SIMILARITY



A case of Darwinian devolution among men that perceive each other as different and enter in a perpendicular, Darwinian relationship and a case of social evolution between 2 forms that perceive each other as equal and enter in a geometrical and causal relationship of parallel love.

30. Logic and geometric postulates

Why geometry needs 5 postulates if the 1st, 2nd and 4th define perfectly a fractal space/time in 3 growing degrees of complexity: the singleton point, the line of communication or wave and the network or plane with volume? Because the 3rd and 5th postulates are not about fractal space but about fractal time; about information and formal equality, *about the logical scaffolding of mathematical equations, which so often is forgotten but shapes the underlying formalism of all mathematical statements (as per Frege and Gödel)*. Since:

- The 3rd postulate defines the degree of self-similarity between 2 fractal objects. Classic geometry considered equality based only in the external form, regardless of size and inner content. But beyond the idealized world of Euclid, equality never exists when we consider the inner form of those points made of inner networks of energy and information that contain dark spaces and inner parts, which make even twins slightly different. Thus fractal geometry defines instead the relative

degree of equality of 2 forms, according to the self-similarity of its inner, informative content and scale, not according to the equality of its external, mutating membrane, which often is hiding, as in camouflage, a different form.

Self-similarity matters because the social evolution of points that become part of networks that deliver to all of them the same energy and information requires the capacity of those points to process the same energy and information, within its inner parts. *Thus only self-similar cells with the same 'genetic=temporal information' evolve into organisms.* And this happens in all scales. For example, the superorganisms of history which are 'memetic organisms', in which each human being is a cell of the super-organism with the same ideological mind based in the same memetic code (same religious code of 'revelation', same laws in a national super-organism, etc.) must have the same mental beliefs. It doesn't matter to form the organism if the DNA code is this or that one, if the believer that forms a religious superorganism believes that Allah or a turtle, or Christ or Yvwh is the name of the God – as long as he has the same memetic code in his mind. Since the rule that matters is the degree of equality that triggers the creation of a social, tightly packed organism acting as a single whole. For the same reason, since reproduction is based in genetic information, only species with the same genetic information can reproduce and since they have the same equal form, it is a rule of nature that only reproduced cells of the same species form an eusocial organism – a key law to fully grasp the evolution of organisms and societies, in which a 'prophet' becomes the first DNA cells of a new civilization. *While species that cannot share information to hunt through common networks or reproduce will consider the other point/species a form of energy and prey on it.*

Thus surprisingly enough geometry determines behavior; form and function again go together and fractal geometry tends a bridge between physics and biology, explaining how species will communicate: if those 2 points perceive each other as

equal, they will evolve into a social network co-sharing their ability to gather energy and information. If those 2 points are unequal, they will establish a Darwinian, hierarchical relationship, in which one becomes the victim and the other the predator. Thus the 3rd postulate is no longer an abstract, geometric postulate, but a postulate of logic relationships, fundamental to understand the why of motions and behaviors.

Since self-similar points evolve socially through networks and communicate through a common language of information to survive better as a single social species. So we can resume the main sub-laws and causal, geometrical chains of the Universe with the 3rd postulate:

3rd postulate of relative self-similarity:

'Points that are self-similar in information evolve socially into a present network. Points that are different in information will treat each other as relative energy and evolve towards the future into a hierarchical organism as a system of 2 points, one of energy and one of information, related by constant flows of energy and information. Or devolve towards the past into a Darwinian system is one in which both flows are not constant.'

The 3rd postulate explains why men do not perceive Universal entities as intelligent: beings perceive itify other forms whose flows of communication don't understand as energy forces that they 'destroy' and feed on, without perceiving its 'organic qualities'. However, even the smallest point known to man, the photons of 'light-space' show the 4 basic qualities of all organic systems that biologists use to define life, the capacity to process energy and information and the capacity to evolve socially and reproduce: photons carry energy and act like the minimal unit of information, because light transmits all type of images through its photons; they reproduce their form in the vacuum; and they gather in social herds of colors.

The 3+i arrows of space-time are the will of the Universe that all its beings share across all its planes of existence. Yet the rules that define behaviour between species, the limits of perception of the inner informative language of other minds and the need to use as 'energy' other entities, regardless of its inner information (so hunters feed on bodies and throw away the informative heads of lesser energy), imply that humans always deny the sentient, intelligent universe, and the invariance of topological form between those scales, itifying reality.

Recap: the 3rd postulate of relative equality define two forms as self-similar when their external, energetic membrane/surface and inner, informative minds are equal. Depending on the degree of equality species will evolve socially into tighter organisms (when they are self-similar) or hunt each other as different species.

31. Equality and social evolution. A new concept of truth.

Equality is the key concept in our definition of mathematical truth as, =, is the operandi of all mathematical equations and in logic, the necessary reason of all logical statements. Thus a fundamental change in our concept of truth follows from the understanding of self-similarity as a different proposition to equality: If Euclid defined equality based on the surface of objects, without taking into account their relative size and inner content, this no longer holds. Things might be similar in their surface and maybe in their content but they are never equal, at most self-similar, nor are equations and any linguistic state an absolute prove of truth, but linguistic self-similar images of the recurrent cycles and events they represent.

The 3rd postulate eliminates the word 'equal', which is so important to define truth as 'dogma'. There is not absolute truth because we cannot perceive completely all the fractal information of the system and so we can merely consider the degree of self-similarity of two beings. Thus, a far more sophisticated and 'real' logic appears – that of the relativism of all truths which are related to the perception we have of reality,

to our diffeomorphic=local point of view that will distort reality to cater to our selfish will (Galilean and Darwinian paradoxes), and to the quality of our senses and minds.

Thus we rewrite the 3rd postulate of Euclidean geometry, which defined the relative equality of 2 beings, based only on the external comparison between beings, as ‘points without parts’, to introduce the existence of inner energy and information parts in all beings. The new 3rd postulate of i-logic geometry establishes now the inner degree of equality between the parts of those beings as a previous requirement to judge the result of all social communication. The old Euclidean postulate of equality caused all type of errors. Since often points pretend a false, external equality. For example, the main stratagem of hunting in Nature is camouflage, based on the equality of external forms. So the victim accepts that equality as a sign of friendship and initiates a type of ‘positive’ communication, coming closer to the predator; but since the victim is different the predator kills ‘it perpendicularly’. That subtle difference between the real world and the abstract world is paradigmatic of the relativism of perception. If Euclid was right, hunting would be impossible, because camouflage could not exist. But real beings have internal, different parts. Some insects imitate wood to hide themselves but they are not wood although they seem it, because their internal parts are different. Otherwise there could not be hunting, based in the strategy of camouflage, as predators simulate the external form of victims or hide in dark spaces, from black holes to lionesses. It proves a fundamental theme of religion: forms that are equal, in this case all humans who have the same genetic information, since they can all reproduce, should love each other, and share energy and information to create a collective organism, a global civilization or God of History.

Recap: Truth is relative to the quantity of information we have. Thus truth is relative and never absolute.

32. Eusocial evolution Vs. Darwinian devolution.

Most systems are energetic and informative cells put together into 2 networks called heads and bodies that merge, creating organisms and species, where the informative network rules the energetic network in a symbiotic relationship (particles that rule fields of forces; gravitational black holes that rule electromagnetic, energetic stars in galaxies; heads that rule bodies; capitals that rule nations, etc.). How individual cells create complex organisms? How atoms evolve into molecules and molecules into the cellular Plane, cells into organisms and individuals into societies? Through Social, informative evolution, the most extended phenomena in the Universe by which individual beings become organized into herds and organisms when *their cells share the same informative code*.

Biological sciences have taken very long to accept informative, Social Evolution, influenced by the single arrow of energy and the subsequent excessive importance that its founder, Darwin, gave to the fight between individuals. Only in the XX century with the development of the sciences of information, Complexity, Systems Theory and Ecology, we have realized that the Universe is based in the social informative evolution of micro-organisms into macro-organisms. The existence of informative networks explains the growth of species in size, from individuals into societies. Yet according to another fundamental duality between energy and information, social events *can be either energetic, Darwinian, destructive, or symbiotic, informative, reproductive*:

- *Complementary, present, balanced events* happen when beings share the same energy and informative language so they communicate and join forces in their fight for existence. For example, in gender, the female is a cyclical, informative entity that merges with the lineal, energetic male, only when both belong to the same genetic, informative species. Those social events evolve individuals into couples, groups, herds and cellular organisms, creating an evolutionary arrow of social love, based in the sharing of the same energy and information.

Among those social events the most intense is reproduction. Since the ultimate will of each point is to reproduce either by itself (since one is equal to its own being) or with a complementary species of energy (male) or information (woman). You can express that iterating will of all fractal species in mathematic terms with a Generator equation or in words with a logic mandate, as the Bible myths did, making God saying to man, a fractal species, ‘grow and multiply’, which means: ‘absorb energy and iterate yourself’. But the catch is that all other fractal parts of the Universe will want to do the same while energy is always limited. It is the *Jungle Law* that mechanically or biologically all fractal structures of the Universe follow. Because those who do not iterate become extinct and the fractal is no longer. So a fractal point has to erase the information and transform the energy of other fractal point to iterate itself. Galileo’s paradox motivates all points to ignore the rest of reality and take care of themselves, as relative self-centers of their own world. Hence there are also:

- *Darwinian, energetic events*, when the difference of form is so marked that both entities cannot share the same language of information to form a couple or a herd. Then the stronger predator will explode with the arrow of death the information of the prey into energy and absorb it to recreate its form.

Such duality of behaviors has set an eternal argument between Darwinians vs. love believers, which as most dualities of science, reflects the inverse nature of the arrows of energy and information: beings that speak the same language of information evolve socially to search for energy, inform themselves and when they are very similar, belonging to the same species, reproduce, *accomplishing the wills/arrows of time in a more efficient manner*. While individuals who do not understand their information interpret and hunt each other as energy. Thus duality proves that neither Love Religions nor Darwinism is wrong. Each one explains one arrow of time. Both together resume the foundation of all bio-ethic systems:

‘Love your neighbour and hunt all alien beings.’

So, there is an ethic duality, which derives from the degree of equality between communicative beings:

- Species that don’t understand their languages of information cannot form working social groups. Thus they kill each other to feed and extract their energy, making the best of their situation.

- Nevertheless there is a social, 'loving' evolution among equal cells of the same species that share the same language of information. And so they evolve from 'individual bacteria' into more powerful macro-organic systems of ‘parallel cells’ that add their fractal actions into simultaneous macro-actions; since social evolution is more successful than individual struggle. So, organisms based in the same genetic DNA-information kill zillions of individual gigantic bacteria; nations with organized armies such as the United States won over hordes of Indians, arguably better individual warriors; while ants rule the insect world, even if a cockroach is individually more powerful.

Yet since all men belong to the same species, we should love each other and evolve into a higher organism, the humankind, as prophets of love have always told us, in order to be more efficient and control properly Mother-Earth. Unfortunately humans still fight wars based in cultural tribalism, which makes us think our nations are different species because they speak slightly different informative languages or races are different because their skin has a different color. The result of such short-sightedness is that we have created partial, fractal social organisms with boundaries called nations. Thus Social Evolution deals with the fight between species and the way in which individuals of the same species organize themselves into societies, stronger than individuals, fitter to survive. Individuals fight for survival, but Evolution is a game of species. The key to survival is not the individual but the cohesive organization of a group of individuals belonging to the same species that act together with a higher energy and

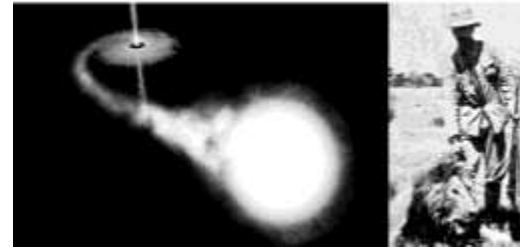
informative force than the individual and so the social individual survives better as part of the larger group.

Today we know that individual lions are less successful than hyenas and wild dogs that hunt in group (25% of captures in lions vs. 80% of captures in wild dogs). Even in the case of Germany, despite its ideology of Racial Darwinism, what really worked was the group - the German collective spirit that made the German army better than the individualistic Italians or disorganized Russians, till communism in II W.W. made them fight as a single organism. Thus social evolution, contrary to common belief, is much more important than dog-eat-dog societies. And that law applies to all systems in the Universe, including herds of stars (galaxies) or herds of molecules (cells) that capture interstellar gas and lonely atoms and explains the st-planes of the Universe as no other theory can.

The fact that the social organism is fractal, fractal, limited in its energy and information is ultimately the reason why individuals gather into social networks, evolving with other cells, since they require energy and information than the networks provide, becoming addicted to them. If the Universe were a continuous infinity with a single 'immortal time', there would not be social organisms, as our inner time of existence would be infinite. Thus survival is again the biological function that explains the existence of organic networks and its cells from the perspective of our limited fractal quantity of life-time.

Recap: Individuals who share the same language of information tend to evolve socially into 'parallel' herds and organisms. Species which share only a similar energy fight to use each other's energy in perpendicular fights. Species without the same energy or information ignore each other.

33. Perpendicularity and parallelism.



In a prey/preying relationship, an organism absorbs energy from a simpler one. In those fights the being with better informative brain most likely will control a better reproductive body (in the graph, the black hole controls gravitation, man the rifle). So it will absorb the other fractal point.

Yet all events are both, caused by the 'form' of the being' and the 'type of motion' or geometry of the encounter. So even two particles that are equal can collide perpendicularly and destroy each other. In geometric terms there are 'parallel' or 'perpendicular' beings, according to the similarity of the information and energy they process within their internal organs. And so we formalize those 2 kinds of events through the 3rd postulate of illogic geometry that defines equality in terms of the inner energy and information of 2 space-time fields and the type of geometrical communication they establish. For example, 2 equal forms in a feeding, energetic cycle hunt together to enhance their survival, running in 'parallel', to 'attack perpendicularly' a victim, whose space-time they 'penetrate' because it is 'different' to them. In the image, we observe such Darwinian geometry:

2 spatial, energetic beings (a lion and a galaxy of stars), with a planar form and max. speed, confront 2 informative beings with a lot of information (a human and a black hole), dominant in the dimension of height. Since information dominates energy and time curves space, when they enter into a relative present relationship, man kills the lion and the black hole feeds on the herd of stars that become past, extinct species. Thus, the spatial 'parallelism' of particles and individuals that gather in

waves and herds is homologous to temporal, informative equality; while the spatial ‘perpendicularity’ of predators that ‘cut’ their victims is homologous to informative inequality.

Given the infinite fractal information of any being, with multiple sub-scales of form absolute equality does not exist. At most we speak of parallelism or relative equality between 2 beings when their internal organs of information and energy process the same informative language and energetic food. Then they can establish a functional equality, communicating together, hunting in parallel social herds the same energy or even sharing genetic information to create a new being.

Those *positive and negative* events can be decomposed further according to the duality of energetic and informative networks:

Non self-similarity of energy and form.

- *No-events of minimal communication*, when both the energy and information of the forms are different the forms don’t communicate, remaining in their discontinuous space-times in parallel, non-perpendicular motion, without contact.

Complementarity of energy and form.

- *Organic, parallel events of max. communication*, when 2 self-similar or complementary forms merge into an organic system.

- *Destructive, perpendicular events* between complementary forms: when the 2 forms have inverse parameters/Time Arrows and come together in a perpendicular process, and become annihilated into the same ‘present’ spatial energy, dilating space and reducing the fractal, temporal depth of the Universe, as when a particle and antiparticle explode into energy.

Absolute Self-similarity=equality

– *Self-Reflective* events, when the form communicates within itself and the degree of equality is absolute, which we divide into consciousness (i->i) and self-reproduction (exi->exi) in

which the spatial present ‘expands’ in time and creates both, a past and future form, as when vacuum reproduces a particle and antiparticle.

Equality of energy.

- *Darwinian events*, when both forms share the same energy but with a different degree of evolution. Thus, a relative future more evolved form and a past form come together and the more evolved top predator ‘future species’ hunts and destroys the relative less evolved past species or victim, evolving the arrow of information towards the relative future ‘predator’ that transforms the past into a replica of its own cells. For example:

- A swallow and a man occupy different relative space/times and use different languages of communication so they ignore each other; they live in parallel worlds.

- Your brain and mind occupy the same space-time because they are the same being. So their relationship is self-reflective and often our mind wonders about the brain and vice versa.

- 2 men seated in a room are parallel informative beings that speak the same language and have a positive communication, called a dialog. But if those beings belong to nations with different languages, religions and customs, as history shows, they will likely enter into a competitive argument or as nations will establish a competitive relationship that might end into a war. Then the nation with more information, with better technology and weapons that give it more Exi force, will conquer, penetrate perpendicularly and destroy the other.

- Yet if both systems have similar exi(stential) power they often destroy each other, as when a particle and antiparticle annihilate or when France and Germany entered war.

- On the other hand, when 2 similar forms occupy the same space, they create a new degree of order in the Universe. Since it is the most important, creative event, we study it further. According to the Ternary Principle we can sub-divide the creative events in 3 possible sub-events:

- A *complementary event*, when one form specializes in energy and the other in information. Then both forms establish a complementary relationship, creating a dual organic system with a body and a brain that share energy and information between them through physiological energetic and informative networks departing from each 'pole' of the couple, forming a single space-time field.

- A *reproductive event*. When both forms create a mixed, parallel form in other zone of space-time in which their combined energy and information creates a parallel being that mixes both exi forces.

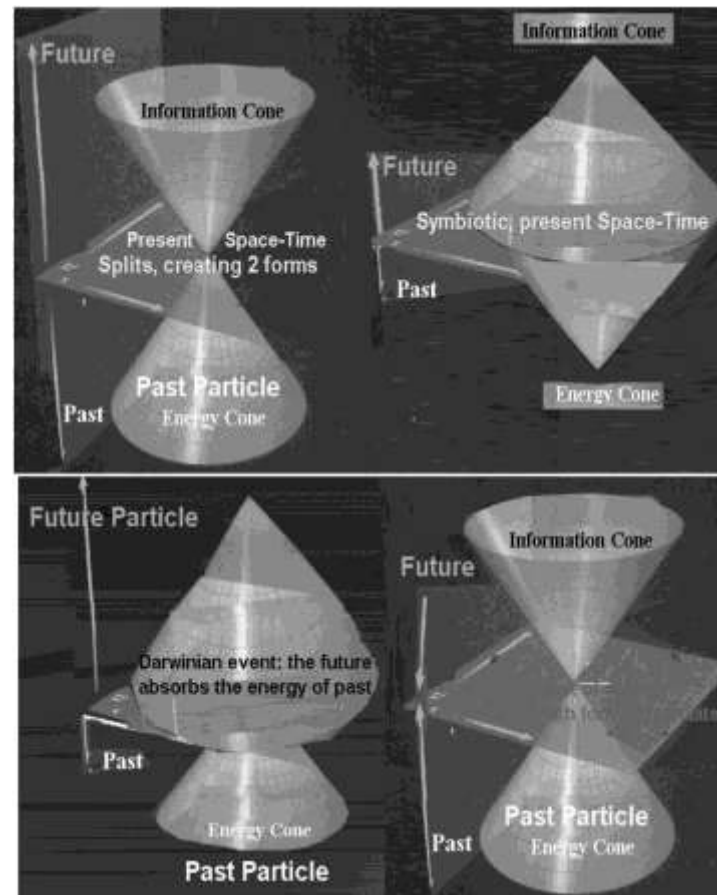
For example, a sexual couple that makes love occupies for a while the same space-time, penetrating each other in a complementary way that reproduces a new being.

- A *mystique event*. When forms fusion into a single macro-form indistinguishable from its parts. So cells become a body; or in a process of perception, the so-called bosonic forces, light particles, create in the focus of a visual organ in which they occupy the same space, a complementary image: *In Non-E geometry*, Riemann described a certain space according to the homogeneity of its quanta that diminish their distances till they fusion together when they are equal. So in Riemann's classic example light quanta of the same frequency become the same color. In Physics we say that photons are 'indistinguishable' particles create a 'bosonic' space of relative infinite 'informative density', described by the 'Einstein-Bose' statistics. In Theology we talk of a 'collective subconscious', which fusions the 'informative minds' of believers into a communion of souls that create the mystique experience.

Recap: The degree of equality between points determines their type of Darwinian, energetic or symbiotic, informative communication: '2 points occupying different spaces with different information don't perceive each other and remain *isolated*. 2 points with the same temporal energy are the same point and its relation is *reflective*. 2 points occupying different

spaces, but parallel in their time-information establish a positive social or *transitive* communication. 2 points with different time-information, occupying the same organic space, establish a negative, Darwinian, *perpendicular* relationship, dominated by the point with greater exi Force or relative point of future, which destroys the lesser exi point. 2 points with different information but equal exi force, occupying the same space destroy each other, creating an *inverse* relationship. 2 points with complementary or parallel information, occupying the same space, enact a *creative* event, *fusioning* their existence into a new macro organic system or *reproducing* a 3rd being in a parallel space-time.'

34. Past x Present =Future. Creative and destructive events.



In the graph, a relative future, more evolved/informative species and relative past, more extended/energetic species create different type of events, which can be studied solely in terms of ‘time evolution’ as events between past and future, which will determine the creation or destruction of one or both of those entities in a relative present point, *according to the degree of self-similarity ($i=i$) and complementarity ($e\leftrightarrow i$) between the two entities, which we have just defined with the 3rd postulate of i -logic geometry.* We talk of 4 possible outcomes of those events from top to right on the graph, which uses the standard time cones developed in Relativity Theory:

- *Death Events*, in which a complementary point splits its relative present form into its energetic and informative entities (particle/force field; body/head), which latter dissolve into a lower plane of existence.
- *Life events*, which are inverse to death events, in which a relative energetic and informative, complementary system form a stable, organic knot of present.
- *Darwinian events of: A) Evolution.* In which an informative, more evolved species with higher exI (existential force), destroys the past, less evolved system, advancing the overall ecosystem towards the future. Or B) *Devolution:* its inverse event, in which the simpler form, due to its higher Exi, existential form devolves the future, informative force, absorbed as energy. This event is chiral, in as much as there are more cases in which the informative form absorbs the energetic force, moving the overall time of the ecosystem towards the future.
- *Anti-events*, in which two species with inverted space-time parameters are destroyed, creating a relative present without form (inverted waves, particle antiparticle collisions).

We classify all events of reality from a spatial, formal, topological perspective and in terms of causal, past-present-future time dimensions Then the generator equation of space-time, $exi=k$, can be written in time dimensions as:

$$Past \times Future = present.$$

Thus in temporal dimensions energy is the past and information the relative future of all systems. This hypothesis is consequential with the main arrow of all Time-space systems, $e \rightarrow I$ or arrow of life, and the causality that requires energy to create information, $e \rightarrow i$. Further on, it is a fact of Darwinian Biology that more evolved systems (with better form) win in the struggle of existence, killing and extinguishing to the past, systems with less evolution. So we have a 3rd reason to consider our hypothesis that makes energy and past, on one side and information and future on the other, self-similar expressions

As Einstein put it ‘the separation between past and future is an illusion’ as both are ‘complementary’. Since relative past-reproductive bodies/fields and future-informative systems, heads / particles come together, creating the present forms of reality we observe. So the next step to consider this avenue of analysis of systems in terms of its ‘time dimensions’ is:

Thus, the 2nd/3rd postulates in terms of the 3 causal dimensions of time, past=energy, present=reproduction and future=information define how a single past and future point converge in a simultaneous present.

When we operate with those events and complex algebra of Multiple Spaces-Times, we can obtain some important results, which we can only enunciate in this introduction, such as:

- The overall sum of all the events of the Universe in terms of time is a zero sum, which means that the Universe is immortal and all the events of reality create an infinite eternal present. A trivial demonstration can be made using only the two simplest events of life arrows $e \rightarrow I$ and death arrows $i \rightarrow E$, which gives us: $\Sigma \text{Future Lives} \times \Sigma \text{Past deaths} = \text{Eternal Present}$.

We however sense the Universe evolving because humans are dominant in information and perceive a much longer time-life than time-death. Or in geometrical terms death is basically an event of spatial energy, which releases and expands in space

the form of an entity. *Thus death has a maximal volume of energy release in a minimal time period:*

Death= Max. Spatial Energy x Min. Temporal information.

Thus death is short in time. While life events are evolving, informative, warping, implosive events that happen in reduced space and stillness, but last a lot of time. So life has a minimal volume of energy and a maximal volume of information:

Life = Max. Temporal Information x Min. Spatial energy.

Those results are proved in all scales of reality. So in physical space, the death of a previous Universe (absolute scale), a galaxy (quasar), a star (nova) or a neutron (beta decay), release maximal energy in minimal time.

While in life systems, evolution happens in stillness and minimal space (allopatric evolution of species, isolated in small territories; palingnetic evolution of a foetus in the minimal space of a womb; chrysalis evolution in the stillness of a pupa). And death is almost instantaneous, releasing the energy of the organism that erases its upper, informative plane, st+1 (death of the nervous system), as the cells dissolve and become energy of herds of insects and microbial of lesser form.

Those diagrams resemble Feynman's graphs that explain the possible events and outcomes of particle interactions, which also consider the existence of a relative arrow from future to past, which in Multiple Spaces-Times corresponds to a flow of information (Feynman's diagrams can be considered a particular case of the model of Multiple Spaces-Times).

The graph shows the how of the events but the why is defined by the degree of self-similarity or complementarity, (3rd postulate) of the 2 Points, relative past and future entities of energy and information:

- If both particles are self-similar in energy and information (case not included in the graph) they will come together as part of a bigger social network.

- If both particles are complementary, energetic and informative systems (top graph), they will form guided by the arrow of life a complementary system that creates a symbiotic present from a past energy and a future form of information. Thus in geometric terms, in the point of collision (right side) the system will expand its space-time. Yet the entity will disappear as a relative plane of space-time in the explosion of death (left side), that will split and dissolve those networks.

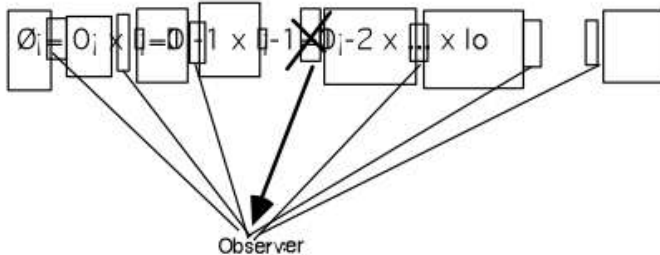
- On the other hand, (bottom graph), Darwinian, destructive events happen among different beings that don't decode their information. If both particles have the same energy, one particle hunts the other (left side). Then, the entity with lesser existential force will die (bottom particle), and the one with more force will absorb and grow with the energy of the 'victim'. Or both points might ignore each other when neither their energy nor information is self-similar and so the event of communication will not happen (right side with no space-time in the point of present).

Finally, all those events respond to a dual, spatial geometry:

- Darwinian events are perpendicular relationships, in which a predator invades and penetrates the vital space of the victim. While symbiotic, positive, social events happen among *equal, parallel species* that understand each other's informative languages and maintain a parallel distance either as a hunting herd or an organism, acting with the same motions in space.

Recap. The 3rd postulate formalizes the outcome of any communication event among relative informative/future and energetic/past st-points. The key factor to determine the outcome of an event between 2 Fractal Organisms is their degree of informative equality. Since most organic systems that can communicate by sharing the same type of information in a common language become symbiotic, as they prefer to share information than destroy each other as relative energy

VII. 4TH POSTULATE: PLANES OF EXISTENCE.



In the graph, a complex organism can be written with the algebra of Multiple Spaces-Times as a chain of points joined by energy/information flows between several 'planes of existence'.

35. The 4th Postulate: networks and chains of existence.

Exact topological graphs however are only important when we study simplex, physical, homogenous planes where the diffeomorphic dimensions of energy/form/reproduction correspond to the 3 dimensions of Euclidean space.

Because of the flexibility of networks can adopt open and closed, motion and formal geometries in most cases, such as the graph we have to consider more than the basic O-cyclical i-nformative and |-energetic forms, shown in the graph, with symbols of i-logic, the causality of the events, which allow us to apply the same laws to all disciplines. For example in Economics Ricardo points out to the logic of increasing communication between points when he explains the advantages of free trade of different products between nations (nails from England and Porto from Portugal).

The same ruled applied to points of view means that 'complementary points' of energy and information that can exchange energy on one side for information on the other side are beneficial for both points of view. This explains the abundance of dual, complementary, fractal structures in which 2 networks, one of energy and the other of information entangle together, as in your body (nervous and blood system) or in the Universe (light and gravitational networks).

We have now the tools and understanding of the structure of mathematics to tackle in the rest of this work on the Languages of spacetime the 'big question' about reality that those languages enlighten: how can we describe better, the construction of the super-organisms of knots of time, which extend through 'several planes' of existence, and underlie the 'structure of reality'.

All this belongs to the most complex and fundamental postulate of i-logic geometry, the 4th postulate, coupled with the understanding of the 'causal, multiple logic of time arrows' that structure several planes of existence, *displaced not only in space but also in time*, into a single organism.

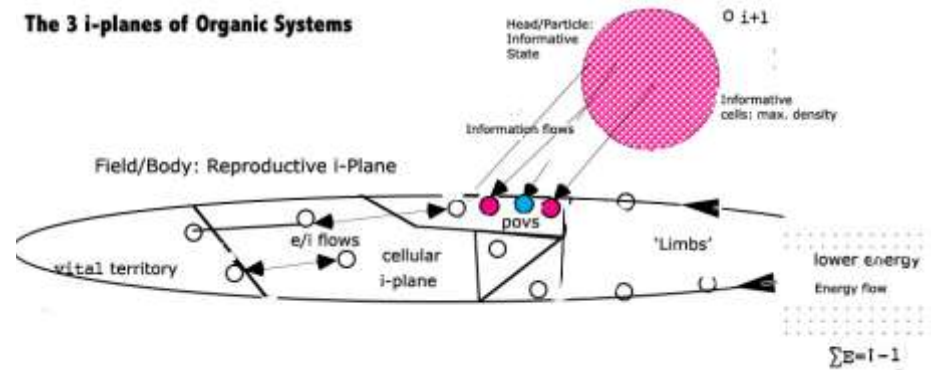
The Universe is a fractal of planes of space-time', which constantly appear, grow and dissolve in infinite events of existence. How Multiple Spaces-Times become chained and connected, building from simplex particles super-organisms - those planes of existence of reality that structure the Universe? The answer is the 4th postulate that defines the creation of networks of points, called planes.

Each st- point is a knot of times that becomes chained in a dynamic relationship with other points of time through its arrows of energy, information, reproduction and social evolution. In this manner points form 'chains' of existence, which become either 'Darwinian relationships', when one of the 2 points of communication is ab=used as energy of the other one with 'more existential force/momentum' or a stable, complementary relationship if both points are symbiotic, as energy and information or parallel, self-similar, forming a herd - a network of equal points that act together as a whole.

In Geometrical terms, the Universe starts with simplex st-points that communicate flows of energy and information, creating lines and geometrical groups. And the rules of those geometrical events of creation are defined by the 1st and 5th postulate that explains the parts of the point and its apertures to the external universe from where it communicates flows of energy and information; by the 2nd and the 3rd postulate which define in geometrical and behavioral terms the relationships and lines of communication between two points, according to their degree of equality. So the 1st/5th postulate, which defines geometrically and logically a point and the 2nd/3rd postulates, which defines how they communicate, establish the conditions that will determine the type of topologies or network/spaces that the system creates. Those organic topologies is what we call planes of exi=stence, explained by the 4th postulate of i-logic geometry. Since a plane is a group of points coming together as a relative space, which will be 'more dense' according to their degree of self-similarity (Riemann's masterful definition of any space made of Non-E points).

Thus, if the first & fifth postulates are related to the perception of information and energy by a point, with its inner body/head parts; and the 2nd and 3rd postulate are related to the arrow of reproduction between complementary energy/form, male/female, yang/yin beings, the 4th postulate explains the details and possibilities of social creation of arrows of time; facts which establish a clear mathematical relationship between the arrows of time and the postulates of geometry in which all mathematical laws are based.

36. Creation of Planes of Space=networks of points



The Universe constructs super-organisms, building Planes, which are networks/herds of non-Euclidean points, step by step, according to the geometrical and biological laws, described in the 3 first postulates of Non-Euclidean geometry: The graph breaks a standard knot of time in its 3 planes. The point is an entity that constantly searches information with its head and energy with its body, creating symbiotic and Darwinian events with other knots of time, through 3 time

arrows/dimensions between 3 planes of existence, the plane of the point, i , a lower plane of relative energy, $st-1$, and an upper plane of relative information, $st+1$.

In the graph we show the point as a complex $i\pm 1$ plane, interacting with that plane or ecosystem (geometrical/biological jargon) through those 3 arrows, which are its 3 dimensions of existence or 'vital coordinates' that create the motions of information and energy of those points. Because the frequency and speed of those arrows/exchanges of energy and information with the ecosystem vary, we also talk in complex Time Algebra of 3 relative speeds, V_s , V_t and V_{ts} , which correspond to the arrows of spatial energy, temporal information and reproduction of the point, (for which often the point will chain itself with a relative complementary being), normally represented in the $x(se)$, $Y(ti)$ and $z(st)$ coordinates.

Further on, those 3 'actions', 'arrows' or 'motions' of time produce in the spacetime around the point different dynamic transformation:

- $I < E$: Energetic arrows produce an expansion of the spacetime around the point as in a big-bang or process of death.
- $E > I$: Informative actions produce an implosion, as energy becomes warped, informing the point.
- $EI = ei$: Finally reproductive actions tend to maintain the space-time around the point stable as they combine the arrows of energy and information, creating a self-similar point in a parallel region of space-time.

And we use the geometric/algebraic symbols of implosion of information, $>$, explosion of energy $<$, and parallel creation, $=$, to signify events belonging to one of the 3 arrows/dimensions of the point.

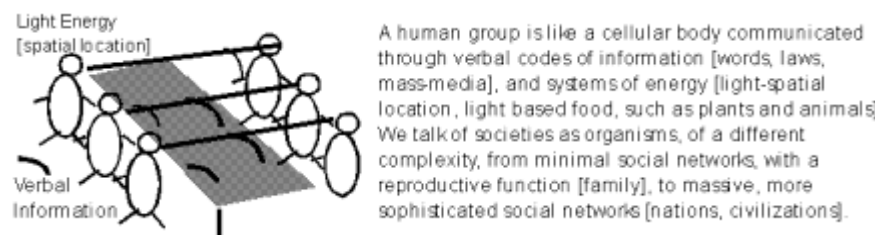
Thus, those 3 dimensions/arrows of time define the self-similar will and actions of most entities of the Universe, despite their apparent, different morphology and degree of complexity.

The interaction of those individual points of view, constantly throwing its 'subjective arrows of time', capturing energy and information from the universe, is the game we all play, and in doing so we establish relationships with other self-similar points of view, creating herds, 'parallel planes' of points of view or Darwinian relationships between relative energy victims and top predators, which we represent as events between two different planes of simpler and more complex forms: $E_{st-1} \rightarrow I_{st}$, where E refers to the energetic function of the victim, belonging to a plane ($st-1$) of less complexity than I , the predator belonging to an upper plane of more information, I .

All those relationships are reflected in the drawing in which we see complex chains of time arrows between points of view, which forms an organic system. In each plane of existence or scale of the Universe such chains will represent a specific species that curiously enough show homological properties with other species of other scales existence. The previous graph could be, for example, a complex molecule. Such molecule represented here with 'Time Algebra' could also be represented as classic chemistry does with 'lines' of forces and 'spheres of

information' that will show the geometrical topologies of those points.

37. Organic systems of points in different scales of reality.



In the graph, when we visualize the world in terms of points of existence and flows of communication of energy and information we can see the dynamic creation of networks of points of time in any scale of reality.

The graph shows a group of human beings, whose cyclical points of view or heads, are maintained in a parallel, relatively equal plane of existence to share information through flows of words communicated through the air medium/space and share energy coming from a relative 'lower' plane of existence, the table. Arguably those configurations are not different from the ones established in atomic networks or herds of sky gulls moving towards the lower plane of seafood as they maintain their parallel distance based in the sounds and motions of the air. Moreover human beings will always try to maintain such geometric configurations between their Non-Euclidean points =heads (not between their bodies, which are blind tails of energy for those points/heads that store the will of times): Observe humans relating to each other with motions and words

emitted by their heads that are always kept in a relative parallel plane of existence with other human planes.

Reality is a game of points that gauge information and form lines, by sharing energy and information with other forms of view. Those lines, $e \times i$ become then networks of self-similar points, planes of existence, of which the most sophisticated is a complementary, social organism: $e \times I + E_i$, made with a head/particle dominant in information and a body/field dominant in energy.

When many points=cellular elements communicate they create more complex simultaneous presents by self-repeating in growing scales those 'simplex' patterns. And finally, through those multiple events they transcend, emerging as a new Plane of Existence. Such systems explain the structure of all kind of planes, including the simplex physical planes. So recently fractal theorists have proved with a theory called 'causal triangulation' that Time Arrows can form causal triangles whose connections grow by iteration till reproduce the 4-dimensional Universe of Relativity. Thus, when we generalize the 2nd and 3rd postulates to n-points in communication we create a finite, organic 'plane of existence', either a simple network (such as a Crystal or a sea of water) or a dual network, a 'complementary organism', with 2 $e \times i$ networks.

The subjective will of ∞ points of view, acting selfishly come together creating a complex, eusocial reality. Order dominates the chaos of infinite selfish points of view, building a single reality, for biological reasons: The survival of points is better achieved, when acting together. So they become stronger than

individuals; hence they win in the struggle for existence, defining in the process an arrow of social evolution that creates with herds of points, fractal, social planes and cellular super-organisms. So points first associate in couples that share flows of energy and information, creating waves = lines with volume, whose shape in space and duration of time is defined by the 2nd and 3rd postulate of relative equality (self-similarity). And finally they create complex organic topologies of existence of a relative number of infinite points of view.

When we add on all postulates - the structure of each point (1/5th postulates), the types of connections and waves between them (2, 3rd Postulates), and the causal, i->e->r->s chains of the Universe - we can explain creation, since the number of combinations of e and i is obviously limited; and so are the number of events, of reality. Thus we can know the outcome of each and every possible event or combination of the 3 wills=arrows of time of each point, (energy, information and reproduction), according to the 3rd postulate.

Thousands of pages and mappings of the laws of existential geometry, applied to each specific species and scale of existence of the Universe, prove that reality is quite deterministic, in as much as points constantly behave in the same manner, absorbing energy and information and trying to emit it with the purposes of reproducing or playing a social role in a higher plane of existence.

Of all those possible events, the commonest chain of existential events departs from a point of view that gauges information, in order to absorb energy, till it can reproduce its

fractal form, ExI, till creating a social mass of points, $\sum Exi$ that become a stable network, st, a vital, topological space: $\sum Exi = st$.

Thus, the Universe creates constantly ‘feedback equations of existence’, the ultimate essence of all realities.

Recap. Self-similarity determines the different ways in which Non-E points relate to each other, either associating together or fighting for survival, trying to absorb the energy of other points when they don’t understand each other or building social planes when they can create informative networks. As a result, and when those relationships are generalized to $n \rightarrow \infty$ points we obtain different organic planes of social points.

38. Dark spaces: the rest of the Universe.



Points of view are a mixed topology of membranes with open balls, which have a dark space they can't see.

Topological planes are dynamic, geometric networks of st-points=numbers, constantly moving and communicating through flows of energy and information. Yet those networks rarely form a continuous tight space: space-time planes are filled with holes in which other networks might co-exist, or where flows of unknown, dark energy and information cross.

Thus, the creation and destruction of networks of self-similar points of view - the generation of complementary organisms - is all what we see; but there is also all what we don't see, as most information and flows of communication between p.o.v.s, which are not similar to us, remains invisible.

Such dark space will be the surface of reality that a st-point with limited apertures to the Universe cannot perceive (an energetic mouth, an informative eye and a reproductive jet).

The degree of 'dark space' a point does not perceive depends of the complexity and apertures of the point. If we consider the simplest bidimensional point, a pi-vortex made of 3 standard units that form its outer membrane, it will have $\pi-3=0'14$ apertures to the Universe. And it will have a total dark space of $0'14/\pi=96\%$ of circular reality, which the point doesn't see through its apertures. That quantity is curiously the same quantity of dark, gravitational space and matter we do not perceive as beings belonging to the membrane of light-space.

So all planes are quantic networks of social points/cycles put together by n-flows of temporal energy, which have 'dark spaces' within the holes of the network:

'A plane is a network of n st-points joined by flows of energy and information'.

The existence of dark spaces and planes which are discontinuous networks is essential to build up a Universe of multiple worlds, webbed into a relative infinite number of parallel planes that intersect, communicate through bridges between the network-planes and allow the existence of

complex complementary organisms in which a relative wider, simpler energetic network is controlled by a denser, smaller, informative one, intertwined through those dark spaces.

Thus without dark spaces a complex reality of complementary beings is not possible. In the Universe the membrane of dark matter are the points of a network of flows of dark, gravitational energy over which the electromagnetic membrane warps itself, absorbing that energy and forming light-waves and more complex, evolved light particles.

In a human being, the blood network surrounds and warps around the digestive network from where it obtains its energy; and the nervous, informative network surrounds and intersects the blood network from where it obtains its energy. It is thus precisely the fact that planes are networks of points and dark spaces fill most of the network what allows the interaction between complex planes that form organic systems. A human being is in fact made of 10 of such subsystems totally warped together in exchanges of energy and information that permits our existence.

All this is the essence of a reality constructed with multiple planes of space-time that biologists recognize as networks of cells' but physicists, stuck in the paradigm of metric measure of a single, continuous space-time still fail to recognize.

Recap. Points perceive through apertures only a part of the Universe. We could theorize that all what we see is merely the light-space membrane that floats in a much wider gravitational Universe.

39. The continuous and discontinuous reality.

The human aberration of perception is the true barrier modern science has to accept those living cycles. And so we define according to the Fractal Principle, 3 phenomena that create that aberration of perception: the limited scales of space we perceive, which prevent us from seeing in detail small or far away beings; the relative speed of human, cyclical time we use to observe reality that prevent us from perceiving very fast or very slow beings as living beings. Finally, our incapacity to translate other languages, as information is smaller and quantized. Therefore, we perceive better bodies and energy than minds and brains. This creates the 'energetic aberration of naïve realism' that makes scientists think all is 'energy' and information is secondary. Since informative messages, which are 'faster' and 'smaller' than energy forms are the most difficult to perceive.

We don't see pheromones and so biologists thought for centuries ants acted as individuals when in fact they act as part of a whole super-organism, the anthill. We did not perceive the informative, chemical languages that cross 'the synapse' between neurons for so long, that most scientists thought that the entire brain was a cell to be able to work together until Cajal saw those discontinuities. Yet today biologists are decoding new languages of information: they found that monkeys learn to use money, rats sing songs, flies calculate. So the real barrier to understand the intelligent Universe is ideological, anthropomorphic mechanism. Only when science accepts organicism, it will start to understand the whys and wills of reality instead of merely gathering data. To perceive

that organicism it only has to 'translate' different speeds of time to the 'real speed' at which any species exist.

Let us consider one of those dualities in more detail: the continuous and discontinuous reality, ruled by a simple law that relates two different scales of existence.

'The mean distance in space-time between 2 relative cells, st-1, of a fractal superorganism, i, equals the distance between its relative molecular systems, st-2, in time and space.'

The law of fractal jumps structures hierarchical organic systems through social planes, Est, of different i-nformation, among which the fractal jumps take place:

So beings seem continuous because their discontinuity is minimal, only a 'cellular' distance, both in space (so between axons, a simple chemical molecule overcomes the jump) and time (so chemical information, the next simpler language of life, jumps and translates the electronic message through hormonal discharges). Again between molecules the most habitual distance is that of an atom of 10⁻¹⁰ m.; and between atoms in its solid, informative state, the usual distance is a valence electron, its lower formal level. While between electron orbits the quantum jump is a photon with a constant of space-time, h, which is omnipresent in all the electronic cycles. In the same way a biological, fractal jump that reproduces a foetus implies the minimal fractal jump in space as the child is born contiguously to its mother.

Though st-points are discontinuous they have 3 apertures through which energy and information flow. Those apertures

are fractal, small holes where only st-1 particles might flow. Hence the st- point communicates quanta from its lower, past scale of existence. All communication acts are fractal jumps both in time and space that can either communicate energy or information between similar particles or particles from $st \pm 2$ planes of existence according to hierarchical, illogic laws:

'2 particles on the same space-time plane transfer information and energy in both directions.

A st-1 space-time plane transfers energy to the st- plane from which it receives information.

A st-2 space-time plane transfers temporal energy, without receiving anything on exchange.'

Though the existential laws of i-logic might seem strange to the scholar accustomed to operate in abstract, they do apply to reality and reach enough detail to connect them with experimental events. The strength of a communication or bondage between knots of time is the essence of what the 3rd postulate measures. And such bondage is maximal in complementary forms, couples, and then in parallel forms, brothers. It is all about bondages creating strong knots of time due to the symbiosis of the arrows of existence of two forms. Forms share and the frequency increases the speed of the cycle of sharing. All action requires a reaction. Newton in fact defines the principle of cyclical inertia, which the 2nd and 3rd postulate clarifies further.

Those laws are based in the hierarchical structure of the Universe that creates organisms with 3 discontinuous 'social

classes'. So only particles from the first plane enter into just action-reaction processes - while flows of energy and information between 2 different, st and st-1 planes are asymmetric as the upper classes receive energy and give only information. But we said that Fractal jumps are contiguous, so how in the 3rd case might exist a flow between st-2 and st planes, separated by 2 scales? Obviously because the st-1 space-time field dies, exploding into st-2 particles that feed as energy or information the st form. Thus the 3rd case describes the extinction of a victim that the predator absorbs after destroying its cellular parts. For example you feed on the amino acids of the animal you eat, after destroying its cells into its micro-particles.

The previous ternary events, which can be formalized with the symbols of Fractal logic, are essential to describe and explain all kind of mysterious phenomenon in physical and biological space-times. Let us consider some examples:

- Borders between the 2 planes of physical space-time, the plane of gravitational masses and electromagnetic charges, are black holes that emit dark, expansive, gravitational energy. Still 96% of the gravitational world is invisible to us, including the discontinuous inner dimensions of masses, quarks and black holes.

- The 1st case between equal forms writes: $ExI \langle ei = ie \rangle IxE$. It explains the 2nd law of Newton, the law of action reaction, according to which, exi , the fractal action of Ei over Ie , is equal in value to 'ixe', the action of Ie over Ei .

- Yet what Newton missed was the fact that ‘actions’ and ‘reactions’ are equal in Exi force but not always equal in substance. It is the 2nd case that explains relationships between 2 different planes of existence: Often an action is informative and its reaction is energetic and vice versa, so they compensate each other, cancelling the past and future into a present. It is the principle of conservation of energy and information: Energy becomes transformed into information and vice versa, $E \Leftrightarrow I$. Fractal physics explain the 2nd case with a mysterious principle that not even Physicists fully understand: ‘time and space are non-commutative’. That is $I \rightarrow E$ is not $E \rightarrow I$, $I > E$ is an energy transformation and $E > I$ is an informative flow. And they are not the same. So in quantum physics and Fractal theory the order of the parameters of an action matters.

Recap. Energy flows towards the informative, future form and energy towards the past, establishing a hierarchy between information and energy, the 2 simplex arrows of the Universe. Both together create hierarchical organisms, distributed through several planes of existence in chiral, hierarchical 3 class-structures, in the dominant dimension of height and information. Only a present space, repetition of the same form in extended surfaces is democratic, equalitarian, creating a mass of undifferentiated quanta without much height dimension.

40. Organic networks as planes of existence.

The 4th postulate of Non-Euclidean-geometry explains how to create a plane as a network of ‘simultaneous, present, self-similar beings’ created by the multi-causal flows of energy and information between all those self-similar points that merge together into the organism. Since the fundamental

mathematical property of those points-beings is its social nature. Indeed, a number - the social unit of algebra - is a social set. While a plane - the social unit of geometry - is a social herd. Thus, the fact that all beings have mathematical properties means they associate in herds and organisms, represented by sets of numbers and topographic 4-D planes, which are networks made of fractal points with a certain content of spatial energy and information. A plane is a network of points – reason why we can relate geometry and numbers. If we return to a previous example, a ‘point’ is the minimal unit or number ‘1’. Thus, a number is a ‘class or set of self-similar beings’ simplified as ‘points’ (so we say 3 not 3 pears or 3 humans). Mathematics in that sense, in its simplest elements represent the rules of engagement of ‘herds of points of view’, since ‘each number’ has certain geometrical properties, so 1 is indeed a point, 2 define a wave of communication, 3 form the simplest plane, and those 3 fundamental numbers have only a variation (you can only draw a figure to connect them). So the ultimate answer which explains the enormous application of mathematics to describe the behavior of any ‘group’ is precisely the existence of ‘Laws’ which independently of the type of entity of energy and information we describe, apply to all points of view, to all entities and scales of reality and to all herds just because they are herds=waves and they are systems of energy and information. Those general laws that apply to all beings by the mere fact of being made of ‘spatial energy’, a substance with geometrical/ mathematical properties and being part of a group or ‘number’ whose social properties are defined by the possible relationships between couples, triads, foursomes and tetrarkys are the laws we are most interested in.

The most important universal numbers are the decametric scales since 10 is the ultimate constant of the Universe, the perfect network, the most common number of 'points' that create a fractal network, $3 \times 3 + st$. It is the tetrarkys already understood by Pythagoras, who considered it the perfect number: 3 elements dedicated to the arrows of energy, information and reproduction in 3 opposite directions and a 10th element, first of the next scale, communicating them, protected in its center: A perfect topology to play the game of existence. Since *Numbers are geometries that create networks of Non-Euclidean points. And so they can be classified by their efficiency as forms of Nature.*

In that sense, reality is more like a carpet in which several nets web together into a tighter configuration or rather like a cat alley, which we do not notice in our own web of relationships but creates an entire different ecosystem, or the duality of the web of microscopic insects and macroscopic mammals that co-exist in two different scales of reality. Because networks tend to create 'parallel' bidimensional webs, in a 4 dimensional Universe with a 3rd dimension of height and one of motion that constantly displaces those networks, many networks can co-exist and interrelate together, creating the complex ecosystems of reality. Moreover if we consider that 96% of dark space to be standard the quantity of parallel and intersecting networks/planes of existence that can co-exist together is enormous – at least 25 networks, each occupying a 4% of reality can fit in the 100% of spacetime of reality.

Each super-organism is a world in itself, created by the confluence of 2 or 3 space-time networks of energy,

information and in more complex systems, reproduction, where each network accomplishes one of the 3 arrows of time of the organism. Yet the energetic, informative and reproductive network, which extend the point in 3 relative space-times, whose topologies correspond to the spherical, hyperbolic and toroidal topologies of any st-point, become a unit of a new scale of existence of increasing complexity. And so we talk also of 3 scales of size in more super-organisms: the 'molecular', organic and social scales. Finally the whole system will evolve, living through 3 ages of increasing informative warping...

For example, the humans system is made of 3 main systems, the energetic, digestive system; the reproductive, blood system; and the nervous system. The 3 systems are fractal, cellular networks in perpetual motions, which intersect in certain regions of exchange of energy and information. So the blood and energy system intersect in the lungs in which they exchange energy with the blood system and the blood, reproductive and nervous informative system, intersect in muscles, in which perpendicular nerves exchange information with the muscles. And the 3 systems form the physiological systems that define life and its 3 arrows of energy, information and reproduction, each of them attached to a given number of cells. So if we were to take the p.o.v. of the cells, we could also say that the human organism is a network of cells joined by 3 flows of energy, information and reproduction mediated by those networks. Yet all the systems together are what form the Human organism.

Further on, the organism will go through a young age of energy and motion; a mature, reproductive age and an informative age, each one dominated by one of the 3 networks. And it will extend through 3 scales of existence, the cellular, organic and social scale; such as the human being will be born as a seminal cell, evolve into an organism, which will integrate itself into a society and when it dies, it will first erase its social memes, then it will dissolve its cells and so finally it will return to the lower plane of cellular existence in which it was born.

Recap. The structure of super-organisms across several planes of existence is based in 3 networks of st-points, the energetic, reproductive and informative networks. Those networks leave between them a quantity of dark space, where the other networks can intersect and connect with its st-points. Its 'discontinuous borders', are asymptotic bridges where through a change of state, the 3 network/membranes exchange energy and information.

41. Dimensions of organisms made of space-time planes.

Networks of st-point are dynamic 'groups' in motion; either herds or 'rings' extended in two scales of reality, which are tighter and still, due to the 'connections' established on its lower scale. We talk of 'waves/bodies' as herds of quanta or cells and of 'particles=heads' as networks where the quanta or cells are interconnected in greater measure. Thus, while groups/waves/bodies (mathematical, physical, biological jargon) extend in a single bidimensional plane, an informative network extends through 2 st-scales or perpendicular planes; one created by the points and the other by the networks or connections between the st-points and/or the st-points and its energetic herds. So it has 2+2 fractal, holographic dimensions.

Thus, as a consequence of the new definition of a point, a plane becomes now a 4-dimensional 'holographic topography' with 2x2 information and energy 'dimensions', needed by those points to absorb energy and information: informative height that allows the top head to observe the Universe, cyclical rhythms that allow the being to perform its existential cycles, length-speed that moves the being and width-energy that allows the being to store and reproduce its cells. All this brings the theme of how many 'real dimensions' has a given system. And the answer is: depending on how we count dimensions and how many planes we study.

In fractal geometry a network has different dimensions depending on the complexity of its branches and quantity of space it fills up. This was already observed by Peano and Cantor who realized they could create a zigzag line that filled up the entire bidimensional plane. And as a general rule most networks of points can be considered to fill two dimensions and two systems of energy/information networks together to create a holographic intersection that adds up to a 3rd dimension, which finally if it has motions adds up the 4th dimensions of most organic systems of the Universe. Since dimension is a flow (dynamic version) or network (static version) of quantic, cellular points, gathered into bidimensional waves and 4-dimensional space-time fields.

Yet things become more complex when we consider systems that extend through several scales of size, and when we consider the 'amateurish' analysis of dimensions by most scientists unaware of the laws of i-logic geometry and quantum space-time systems.

For example, physicists, without those concepts wonder why strings have 3x3 inner dimensions of space and one of time. This means that they are calculating systems that extend through 3 planes of existence. Further on, those strings then gather in herds called electromagnetic branes, which warp into particles. Further on, 3-D particles form networks that become atoms, and the process repeats once and again till creating human organisms within which those organic points, now called cells communicate energy forces and informative bytes.

There are many types of points with parts, gathering in scalar networks of growing size and complexity: atoms gathering in molecules, stars in galaxies, strings in particles, etc.

A fractal system keeps adding dimensions, as each point becomes part of a network that evolves into a point of a higher plane. Depending on the number of planes through which we observe a point, the total dimensions of the point will vary. As a general rule however, any species of the Universe is fairly described through its main Plane of existence and its lower and upper planes. So a human being is described perfectly as a cellular system in the st-1 Plane, an individual in the st-plane and a relative point co-existing with other individuals in a society in which s/he feeds on energy, information and reproduces. For those reasons we can consider that any point of existence will be described exhaustively when we consider the 9 dimensional networks of each of its 3 main st-planes.

Fractal ±st-point: 3 st-1 D > 3 st-D > 3 st+1 Dimensions

Finally, those planes are joined by ‘bridges’ of energy (from st-1 to st) or information (from st to st-1) called *co-dimensions*

of ‘relative, perpendicular height’, the temporal, evolving dimension that connects them to the upper plane of existence through their processes of iterative growth and social organization. Those co-dimensions measure the relative height or fractal accumulation of self-similar forms that takes place beyond the membrane of the Mother-Cell, as time iterates and evolves the natural fractal into a higher st-scale. Since informative cells accumulate in a relative perpendicular dimension of height, from living organisms whose informative heads are on top to audiovisual towers and satellites, to the perpendicular co-dimensions of microscopic growth of Mandelbrot and Koch fractal.

A fractal ±st-point exists as a 3 dimensional organism, which acts in the external world pursuing energy, information or reproductive goals (mechanically, consciously or in a vegetative way, or even micro-managed by a catalyser or enzyme – facts those, which won’t matter to its dimensional description). In all those cases, time, understood as a form of movement, will be a geometrical movement or cyclical trajectory but also a temporal cycle with a biological, energetic, reproductive or informative function; and a movement traced through a dimension of the upper st-plane of the point. So when a human goes to feed on a dinner, it will enter into a social network of human points feeding on that dinner, which will form an organic system of the upper st+1 Plane. When an electron flows in a metal network of atoms, it becomes a carrier of energy or information between those atoms, and so to its 3 inner dimensions we will have to add an external social dimension in the atomic plane (the only one physicists study in

that case). Yet the electron has also inner dimensions, defined by its quantum numbers.

Recap. For more than a century, Physicists have been troubled by the need on their equations of Quantum Theory, Relativity and String Theory of odd dimensions, whose ‘ad hoc’ explanations varied from an author to another. Yet in fractal geometry the issue is resolved since the concept of an extra-dimension has a clear, mathematical and logic meaning, related to those scales, all of which will have:

- A *3-dimensional sub-space* within their organic forms, as we come closer to them and observe their details no longer as points without parts but as full grown organisms. Thus the existence of 9+1 inner dimensions in objects like Strings means merely that there are at least 3x3 inner fractal micro-scales within the structure of those strings, where those dimensions will be located.

42. The mathematical model of organic, scalar fractals

We can now merge what we learned about the fractal structures of the Universe, and its creation through planes of existence, which are organic topologies made of networks of points communicating through flows of micro-fractal points. The Universe and all its parts follow the laws of super-organisms, which define all what exists as *‘organic fractals made of self-similar cells joined by networks of energy and information’*. Where cells are knots of Time Arrows and fractal means a scalar, self-generated, organic, repetitive reality:

- A reality structured in several ‘scales’ of different spatial size and time speed, such as the smallest spaces move faster and show a higher frequency in its cycles of time (metabolic law, Chip paradox, etc.): Max. E = Min. Ti; Min. E= Max. Ti

- A reality generated by ‘informative’ cycles, which can be described with a generic feed-back equation, $E \Leftrightarrow Ti$, and any of its self-similar specific ‘generator equations’ of information that code the structure of any entity of reality (from DNA genetic codes to quantum equations of particles).

- An organic reality, which constantly reproduces its form *in self-similar, micro-replicas of each point*, and then organizes those self-similar ‘fractal parts’ into wholes, using them as waves of communication that relate points between them or forming with them an offspring of similar beings.

This organic, fractal, informative design of reality, explains why the Universe shows a scalar, social nature, ‘transcending’ from smaller to bigger Planes, invariant in its e & i forms - the energy line and the information cycle - thanks to the fractal reproduction and social organization of self-similar forms.

All those complex systems extend through 3 main st-scales or ‘planes of space-time’, structuring reality as a ‘fractal, non-Euclidean topology of multiple, causal arrows of time’. Yet such complex reality requires new tools of geometry and logic to define properly the laws that relate all the elements and scales of the system. Since most sciences use still a single, continuous space-time plane (Cartesian), a single, Absolute Time cycle (clock-time), a geometry of forms not of motions (Euclidean geometry), and a monist, A->B causal logic (Aristotelian Logic). Thus, a great deal of Multiple Spaces-Times is dedicated to understand the non-Euclidean, fractal geometry of space, developed in recent years, which can study a space-time made of motions (Non-Euclidean geometry),

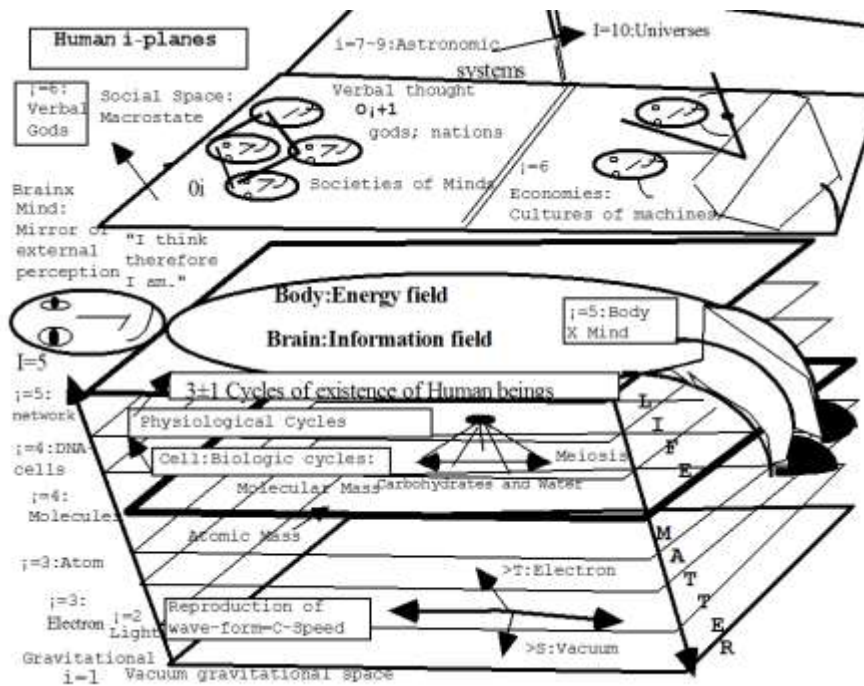
divided in several scales of size and self-similarity (fractal geometry), in which reality is caused by multiple time cycles/causal arrows and multiple agents (Non-Aristotelian logic), tracing geodesics in search of those Time Arrows. Ultimately what you observe is a game of non-Euclidean points=particles=heads, each one associated to a lineal field of energy/body (Complementarity Principle). As entities of energy and information, they are constantly in search of more energy and information to reproduce and form social systems. To that aim each 'Non-Euclidean point of view', the fundamental, formal particle of the Universe, defined by the 1st postulate of Non-Euclidean Geometry (a point, which unlike the points of Euclidean Geometry, have organic inner parts), will start a line of Non-Euclidean communication, (a wave packed with energy and form, described by the 2nd postulate of Non-Euclidean mathematics), shaping 'networks' of energy and information points (topological planes defined by the 4th postulate of Non-Euclidean mathematics), which create a relative 'space-time' being of one of those 'existential scales'.

Recap. Non-Euclidean, fractal space-time was defined by Riemann, who affirmed that a 'space' is a group of self-similar points, forming an undistinguishable 'herd of points' that becomes a homogenous plane. Riemann considered the 'density' and homogeneity of those spaces according to the degree of equality of those points (3rd non-Euclidean postulate) and developed the initial steps of a non-Euclidean, fractal geometry of 'discontinuous points/knots of Time Arrows' that gather into networks, which form organic planes of existence.

43. The scales of reality: human organisms and Universes

A human being exists simultaneously through 10 planes of space-time existence, from gravitational space to the cosmological plane of the solar system. The complex interrelationships between the points of each of those planes of existence, among themselves and its upper and lower scales, create our organism and influence our modular consciousness - as we feel the will of the Time Arrows of each of those scales through different senses: we feel gravitational weight and physical pressure, electromagnetic heat and atomic smells, photonic images and molecular tastes, social love for other human beings and the exhilaration of motion. We are the most complex species of space-time, only because we are the species we perceive better, not because humans are the summit of informative evolution in the Universe. In any case, since perception is reality, we will always appear far more complex in form than the extended Universe, dominant in energy-space, of which we perceive very little according to the paradox of the ego (as we gauge from our perspective and so we see more detail in the closest entities). Thus the study of man as a complex organism should be the leading science, which offers more information. Then by homology we can apply the laws discovered in the study of our organism to other entities.

In the graph those 10 fractal space-time scales of increasing complexity, which emerge from the interaction, chains and evolution of the species of each scale: photons that become particles that become atoms that become molecules that become cells that become human organisms that become social cells of civilizations and economic ecosystems.



The fundamental particle of the Universe is a Space-time Super-organism that repeats its cycles and shapes of energy and information, co-existing between birth and extinction in 3 fractal planes, which can be subdivided each in 3 fractal energy->Reproduction->Information networks (spatial view), living 3 time ages (temporal view) as he fulfills its arrows of existence in those 3 planes.

If we extend that concept, the Universe becomes a hierarchical, scalar system, extended through a series of self-organized st-planes: particles gather into atoms, atoms gather

into molecules, molecules gather into cells, cells gather into organisms, organisms gather into planetary systems that gather into galaxies that gather into Universes. the outcome is a scalar structure of 10 space-time planes, where fractal entities live self-similar cycles of existence under the same space-time laws, from the smallest, invisible plane of gravitational existence, till the Hyper- Universe in which ours is a single cell:

st=1 groups of 'G-constants' evolve, forming, curving the energy of gravitational space into masses.

st=2 groups of 'Planck actions' form the electromagnetic light space, evolved into cyclical charges.

In the st=3 plane of atomic existence, groups of particles became atoms.

In the st=4 plane, groups of atoms became molecules.

In the st=5 plane, groups of molecules became cells.

In the st=6 plane, groups of cells became living systems.

In the st=7 plane, life herds became ecosystems, societies, nations and global planets.

In the st=8 plane Groups of solar systems became galaxies.

In the st=9 plane, Galactic clusters become Universes.

Thus, humans are a st=5, 6, 7 species; since our organic system belongs to the st=5,6 scales of biological cells and living beings, and we belong to the st=6, 7 scales of individuals and social organisms - as cell of a nation or religion.

How many scales reality has beyond the 10 scales humans perceive? Given the flexibility of size and speed of gravitational forces, whose waves Einstein calculated could extend to the size of the entire Universe those scales might be infinite as each galaxy becomes an atom of the next scale. It is also the logic result of thinking in mathematical terms, as the simplest informative fractal, a disk, given the irrationality of π , can reach any infinitesimal size. Ultimately it is a choice of the reader: if he is objective he should observe that for survival reasons, spatial perception always puts him in the center of all his observations of Nature. Thus in the same way space is infinite but we are in a limited, perceived self-centered space, the scales of temporal complexity should be infinite, as *the arrow of eusocial evolution should be acting for ever in the eternal universe of time motions*.

Thus even though the perceived Universe displays only $i=10$ scales to human observers, 'i' probably tends to infinite.



Recap: the universe is a fractal structured in ternary scales that create decametric social organisms. We cannot know if those scales are infinite but the eusocial arrow of love should have act ad eternal since time and space are absolutely relative.

44. The complex causality of Multiple Spaces-Times

The key law of flows between 2 planes of existence is:

Information flows from a more complex, 'upper' plane to a 'lower' more extended plane, $Ist+1 \rightarrow E$; energy flows from a

lower, spatial plane, to an upper, informative plane; energy and information flow within the same plane of existence'.

This self-evident law determines the outcomes of events and the form of structures, from the 3 perspectives of reality:

- *Geometrically*, in relationship with the 3 topologies of the Universe; as it will determine the flows and channels within a certain organic st-point.

- *Temporally*, in relationship with the 3 dimensions of time; as it will determine the relative flows from past to future and future to past, and the simultaneity of certain events in present, between complementary systems.

- *And organically*, when we combine both approaches, as it will determine the key events of existence: the why palingenetic birth and evolution, the process of death, etc.

Departing from that law, we can tackle the most complex level of understanding of reality – the i-logic of systems, created by multiple time arrows, which no longer follow the Aristotelian laws of single causality, $A \rightarrow B$, but the logic of simultaneous present creation, either by the confluence of past-energy and future information, or the simultaneous confluence in a formal ring of multiple, self-similar time arrows. Those complex systems of causality were partially studied by Einstein with its concept of simultaneity and 'convergence' of past, present and future, and by quantum physicists with its analysis of particles and antiparticles and the invariance of physical phenomena regardless of the direction of time we study, but now we can analyse it with more rigor in this and the 2 next

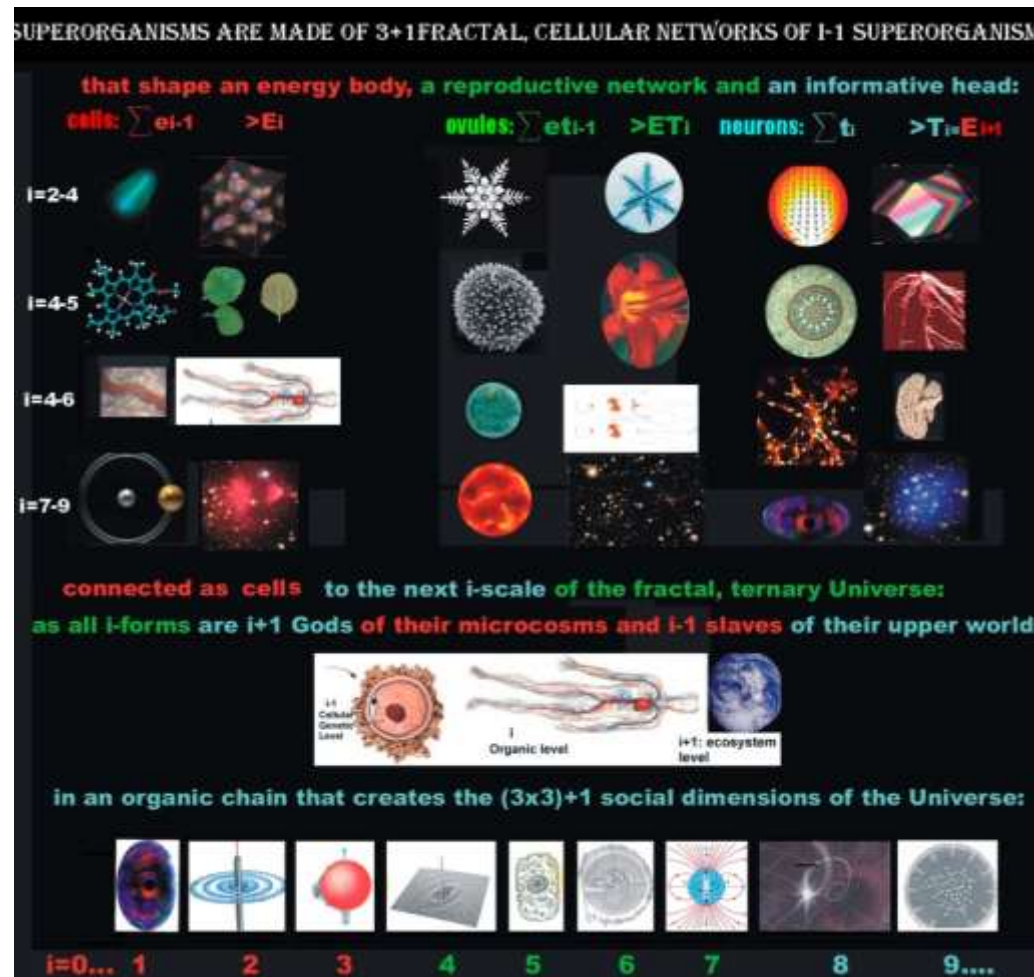
paragraphs, since complex temporal causality and fluxes of energy from a relative past plane $st-1$ to a relative future plane $st+1$ ($e \rightarrow i$) and the inverse process, a flow of information from a future plane, $st+1$ to a relative to past plane $st-1$, is at the heart of the structure of superorganisms ($i \rightarrow e$).

Unfortunately, lineal time introduced in science the concept of single-causality (*ceteris paribus* analysis), which is only a partial analysis of the causality of most phenomena, in which acts a ternary causality (as energy flows from the lower plane, information from the upper plane and complex flows of energy and information happen between the cells of the same plane of existence). For that reason, most scientists constantly argue, considering their 'cause', normally one of those 3 relative events, the true cause. Yet in fact all events need *at least* 2 causes to exist, one from an energetic past and one from an informative future that converge into a relative present.

Let us then introduce the complex logic of organisms with relative future, informative systems and relative past, energetic systems (IX); studying next (X) the causality of a present system or knot of times, made of multiple time arrows/cycles; and finally (XI) some key events of 'existence' in which those flows of time take place, such as the process of palingenetic birth and its inverse process of devolution or 'death'.

Recap. Events require to exist at least 2 causal arrows, $E \leftrightarrow i$.

VIII. PAST TO FUTURE SYSTEMS: ORGANISMS.



Ternary, complex Energy and information systems are made of multiple scales of space/times that act as 3 organic classes.

45. Information networks control energy herds

The beats of all species, as they absorb and emit information and energy in order to reproduce and evolve socially into self-similar or complementary networks, chain them into complex organisms and ecosystems. And since each st-point is always a cellular part of a bigger organism, finally all those beats, cycles and chains become part of an interconnected huge organism, the Universe.

The simpler of those chains are Darwinian events that connect victims of relative energy and predators with a more complex 'form'; the sum of all those chains in a given 'ecosystem' or plane of existence form trophic pyramids.

Darwinian E->I events last a brief period. Yet Nature sometimes converts Darwinian events into symbiotic, dual body/head organisms, in which the 'fastest' temporal, informative beings tame, enslave and control the slower ones. So while the faster lion feeds on the slow buffalo, humans first feed in buffalos and then tamed them, creating a symbiotic organism – the herder and his herd. In the same manner, the first, faster electrical neurons probably devoured, smaller, slower chemical cells, but both together finally evolved into complementary organisms, while the fastest neuron controls the chemical cells of your organism, extracting energy from them. Thus, an organism, we might say, is a chained system of top predator cells that control herds of tamed chemical cells; and an ecosystem is a loose organic system in which the top predator 'cells' only interact with the slower ones when they feed on them.

A 2nd element to understand such chains between faster 'informative cells' and slower energy cells is the fact that the faster cells can dynamically or statically (through a network of connections), control multiple, slower cells simultaneously and vice versa, it can process due to its faster time cycles, multiple messages coming from several slower cells that 'cause' its action. And this happens in all systems, including a human system in which a speaker talks to multiple 'energy believers'. To that aim, we must consider a property of information we advanced previously: its fractal, reproductive nature that breaks a form of information or message into multiple self-similar messages (the speaker that reaches multiple people, the antenna that emits multiple electromagnetic patterns, etc.)

When we put together both properties of informative networks – to act faster and to act simultaneously – it is easy to understand why they can control the energetic cells of the organism. For example, the nervous cells act as fractals much faster than the chemical cells and so a single nervous cell can control an array of multiple chemical cells, because one of its ultra-fast fractal actions move a big distance that encompasses many chemical cells in the time those cells react. In this manner faster, upper class, informative species control slower middle class cells. In the other extreme a stronger ExI species can create waves of energy and information that extend over multiple cells, and so minute changes on its energy and information parameters affect all those cells, reprogramming them. So a small change in the Earth's temperature provokes huge changes in the life of its species. If we generalize those chains to enclose all organic systems of the Universe, the main

systems of reality acquire a complex, deterministic degree of order and harmony that relates the different cycles of being (its informative, energetic, reproductive, social and generational cycles), as cellular units of the bigger cycles of the macro-organism or ecosystem in which it exists.

Finally information cells form complex networks and so despite being smaller in space, the whole network of 'neuronal' cells is bigger than the individual, divided, energetic cells, making easier that control by the 'macro-organism' of information.

The result of those structures is the 3-class structure of all organisms, in which a head/particle of information controls a reproductive body/field of cells/wave, which obtains energy from an ecosystem from a 3rd lineal system of 'limbs/forces'.

Recap. Information networks have 3 advantages over energetic herds: they act-react faster, as they are smaller in space; they produce simultaneous, broken messages that reach multiple cells; and they act together as a single network, due to its multiple connections between them. Hence they can dominate the herds of energy in any dual, complementary organism.

46. Scales and symbiosis of complex social organisms

Thus the commonest system of the Universe is a complementary organism of energy and information, with the 3 topologies of Non-Euclidean points that act as 3 social classes:

-The higher, st+1 dominant class is composed of the informative nucleus, an energetic membrane and its networks that control:

- A middle st-mass of 'cells' in cyclical motion between those 2 discontinuous, limiting zones.

- That transforms the 'lower' st-1 energy absorbed through the membrane, coming from an outer world into information pixels and energy pieces to create more informative cells and energetic membranes.

Thus, the $st \pm n$ parameter becomes essential to analyse energy and information exchanges between the different microcosmic cells and macrocosmic systems of any fractal organism.

If the system is stable because a symbiotic relationship occurs between both networks, we call the complementary, entangled networks - social, organic systems, which extend in two fractal scales of different planes of space-time.

In the previous graph, from left to right, we observe some of those systems as they extract energy from their relative ecosystem/plane of existence:

- A cannibal galaxy traps smaller ones between its informative nucleus and stars' body, which reproduces its atoms.

- The sun system is protected by a series of planetary rings that extend till the Oort membrane of comets; yet we have to observe those rings according to the Galilean Paradox as still forms extended in space. Within that structure of an informative center of mass, and an extended membrane of space, the sun traps, gravitational and electromagnetic energy and atomic dust, with which it created those planets.

- The nucleus of an atom interacts with other atoms to form complex molecules through its electrons, which are the external membrane. Between them, gravitational and electromagnetic energy 'feed' the motion of those 'dominant forms' of its organic structure.

- A cell has a central informative DNA and a protein, lineal membrane and conducts (Golgi apparatus) which trap the reproductive organelles that create more DNA and proteins with energy obtained from the external Environment.

- A bird with an informative head, reproductive body and lineal limbs captures an external energy source – a lineal worm.

Those systems, studied with the laws that relate two or three relative, discontinuous planes=networks of energy and information offer some examples of the complex relationships of symbiosis and hierarchical dependence that take place between planes of existence, and its laws, which find applications in all self-similar organisms and space-time membranes, including the dual system of gravitational information and electromagnetic energy of the Universe within which we exist, or the interactions between the nervous, blood and digestive networks or the informative=high class, reproductive=working social class and energetic geography of Gaia that structure civilizations.

Most organic systems and its cells are created around the dynamic equilibrium produced by the exchange of flows of energy and information of those systems, which absorb them from the external ecosystem with the aim of reproducing in

other region of space-time. Whereas, the 'physiological' laws that control those balances and ratios of exchange become the vital or universal constants (biological/physical jargons) of the organism. For example, a human being is a fractal form, made of trillions of cells, connected by flows of nervous information, digested energy and hormonal, reproductive blood messages. Thus a relative infinite number of $\Sigma Se \Leftrightarrow \Sigma^2 Ti$ cells become joined by those 3 networks, creating a human organism.

And doctors consider that we fall sick when the balances and functions of those 3 systems fail.

Further on, all those st-cells together create a unit of the higher st+1 scale, a human being, which through an entire process of iteration, self-organization and emergence becomes part of a higher st+2 scale, the social scale of mankind, of nations and civilizations. And again a series of balances between the social 'classes' of information that control the languages of power of the nation – money and legal words – and the reproductive, working class and the energy of the environment, will ensure the 'life of the civilization', which otherwise could enter in civil wars or collapse due to pollution and degradation of the environment.

In this manner through eons of evolution, both the human being and the Universe have become balanced, organic systems extended in multiple st-scales of growing social complexity.

The result is a dual or ternary organism: it has a reproductive body, which processes energy with its limbs, reproduces the cells of the organism and obeys a head of information.

So it is a fact of history that you belong to a certain social class, depending on your information and the control you have of verbal laws and financial money, the 2 language of information of human societies. Science calls a dual, physical plane of energy and information, a field of energy forces ruled by informative particles; a biological, dual system an organism with an energy body and an informative head; and a historic system of energy and information, a society with a mass of citizens and an informative government. Yet space-time fields, organisms of energy and information and societies respond to the same laws and properties of Multiple Spaces-Times.

Further on, since each of those systems will in itself possess a ternary structure, where the region that receives information from the head will tend to be slightly more informative and the region that processes energy will be more extended and energetic, we can increase the detail of our analysis by extending it to any number of cells and dimensional, ternary sub-scales. And indeed, more complex descriptions of a human organism consider that we are made of 9 subsystems, which can be roughly divided in energetic, reproductive and informative. And we can also follow the inverse process of evolution of life from simpler systems, which became more complex, decoupled in dual exi, or ternary, exi=r, subsystems and multiply its number of cells, from the initial unicellular bacteria till reaching the human being, the summit of evolution of this planet.

Yet the laws of Multiple Spaces-Times and i-logic p.o.v.s are followed by all the processes of physical and biological systems; among which the law of chiral asymmetry between

planes will be the fundamental law to create a hierarchical structure between planes of different degrees of temporal information; since all of them will be communicated by one-dimensional, asymmetric arrows of energy that flow from lower body/reproductive organs into the upper informative ones, or arrows of information that flow from the dominant informative system into the reproductive/energetic networks. And the same happens in physical systems, between the central, informative knots of mass (quarks, black holes) and the external membrane of fractal electrons and stars (in the case of black holes flows between both membranes are called Rosen bridges, which Einstein used to study the exi flows of energy and information between the plane of gravitation and electromagnetism.)

Where we observe $E_{st-1} \rightarrow I_{st}$ energy flows from past to future, from the class energy to the informative class and vice and $I_{st-1} \rightarrow E_{st-1}$ flows of information from the relative future, informative organ to the energetic one. Since a macrocosmic being has more information and it is more evolved than its relative lower plane of cellular existence (a molecule for an atom, a cell for a molecule and so on), it is its arrow of future. Social evolution creates macrocosms from cellular beings, establishing a hierarchical, asymmetric duality of social classes in all systems:

- The information class (neurons, governors, the rich with financial information, politicians with legal information) do not work=reproduce, but give orders to:

- The st-reproductive class (the cells of the body, the workers, the citizens) of the body which reproduces the forms wanted by the upper class. This class, sandwiched between the other 2 can obtain energy from the lower class and information with the upper class, and through social, democratic love, the sharing of both energy and information, will create new cells, and so it will show a toroidal geometry as it cycles between the 'external membrane' that extracts energy and the internal, hyperbolic region of information from where it obtains its formal orders.

- Finally, the energy class, which gives energy to the other two classes, since it receives orders from the information class in exchange from its energy.

In simpler systems the reproductive class might not exist or might absorb the energy which latter handles to the informative caste (reason why sometimes we call a dual reproductive/energetic system such as the blood system of simple animals the energy system), but in essence this hierarchy between the 3 planes of all physical and biological systems takes place.

This law that we repeat once and again is essential to understand the main difference between space which has parity and it is symmetric and time which is asymmetric as motion from past to future converts energy into information, 'imploding' space, and flows from future to past, convert information into energy exploding and unwarping it. And it is at the bottom of all the processes that happen in time, from the life-death cycle of organisms, which always end up warping all energy into form, to feed its 'selfish' information cells, to the

'breaking of symmetry' that happens in physics in process mediated by the 'temporal', electro-weak force.

Thus, the formal analysis and the study of the hierarchies and relationships between any st-fractal and its lower and upper \pm st microcosms and macrocosms, is an essential part of i-logic Geometry that can be applied to any fractal system in the Universe and allow to define a super-organism as a dynamic, functional structure, regardless of their form and extension.

Cellular herds become organisms that exchange energy and information through common networks, even when we see those cells de-segregated. The important fact is that all the cells of the organism need to be connected through networks of energy and information. For example, in an anthill, ants are guided by a network of chemical information (pheromones) that has its center in the queen and a network of energy distribution (the anthill and its territory) through which energy cells move (workers). There are also other specialized energy species called warriors. Finally there is a reproductive system localized also in the queen (and its males) that ensures the reproduction of the anthill species. Human societies resemble closely anthills with a higher degree of complexity and cohesion, because they are also social organisms of cells-citizens joined by economic, energetic, informative, legal and social, reproductive networks. When the three networks exist, we consider the being an organism. Without any of those organs however the anthill is not efficient and it dies as an organism. If the queen cannot reproduce, the anthill dies. If workers do not gather energy and warriors do not defend the vital space of the anthill, the anthill dies. If the queen does not

guide the workers with chemical information the anthill also collapses. And so it does a society, which enters in an economic, political and cultural crisis that extinguishes the civilization. Only when those 3 networks deliver efficiently energy and information and reproduce the cellular citizens of the society, the vital organism survives. We have to widen our concept of organisms and consider that waves of cells communicated by networks are organisms, even if they have open, dark spaces between them, since they behave in all senses as such organisms. In a fractal universe there are always dark spaces and discontinuous worlds; but what truly matters are the bridges of invisible flows of information that connect those cells into herds, societies, bodies and organisms. Thus an organic species needs 3 networks to exist:

A superorganism exists when there are informative and energy networks that communicate the cells of the organism and the density of energy and information communicated to those cells through the networks is higher than the energy and information cells receive from the external world.

Yet those 3 systems do not have to be pegged spatially to create an organism. On the contrary, the duality between expanding energy and imploding information, continuous wholes and discontinuous parts is the key to understand the flexibility of those organisms that might appear separated as a herd or continuous as a body: the information network attracts them together and the energy network maintains its expansive vital space, separating them. Thus the hardware of information, in this case, neurons are discontinuous but they become a

single whole joined by the software flows - electric information jump through multiple neurons, creating its continuity.

The metaphysical question: a 'conscious Universe'?

The previous results bring about a metaphysical question. Since unless cellular p.o.v.s have a 'Time will' –a desire to survive - and a degree of perception of information and energy, the previous social organic structures should not exist.

Indeed, the definition of a superorganism in terms of networks is clear: the organism tends to maintain itself pegged because cells survive inside the organism better, as they receive more energy or information. Otherwise the cells of the organism will become disaggregated and the organism will die. In the case of the anthill the information that ants receive from the queen is more important than the one they receive from the external world. The ants act under orders from the queen. They also receive energy from the anthill where food is stored. In a body, cells receive information from the nervous system, and energy from the digestive system, which is also more important than the energy and information they receive from the external world. In an eco(nomic)system, individual homes receive more energy from the arterial systems of electric networks and roads, from their work places (money) than from their external space, except in agricultural communities. Humans also receive more information from networks of mass-media than from other human cells. Thus, the economic ecosystem is also an organism of humans and machines, whose networks obey the common laws of all physiological networks.

Thus the informative organ is the ‘soul’ of the system that guides, controls and creates its ‘form’, its existence as a whole. Those informative networks, made of cyclical particles of fractal information are similar to what Descartes called ‘vortices’ and physicists masses, joined by ‘res extensa’ or gravitational, attractive forces; what Buddhists called Atmans, joined by flows of communication; what Leibniz called Monads that perceive the Universe; what biologists call neurons, joined by networks of information. In brief, they are the essential structure that pegs together a relative infinite sum of fractal cycles/cells.

In human societies the army that deploys energetic weapons in the external border and the government and moneyed people that control the informative, legal and financial languages of power are the dominant class. There is a middle class of citizens that obey those groups, which limit their freedom. And there is a lower class of ‘immigrants, enemy nations’, raw materials and machines, whose rights as non-citizens or objects are null. Yet those classes exist in all organic systems beyond human societies:

In a human organism the brain and nervous, informative system, the neurons and the stronger, energetic cells, the leukocytes and the epithelial tissue, control also a mass of cells, which reproduce in the different organs of the body the products the organism consumes, constructed with the bites and bytes of energy and information the external world provides and the human organs destroy and reform. If we consider a galaxy, the inner black hole and the halo of dark matter confine a middle mass of stars that turn around the black

hole - while the external intergalactic space provides the ‘lower’ bytes of interstellar gas. So stars in their spiralled, cyclical movement gather that gas and send it to the black hole that feeds on it. So happens in an atom, in which the electron orbitals gather electromagnetic energy they send to the inner nucleus.

So we might wonder, are human societies just, natural, according to the ternary structure of social classes? No. The present distribution of social classes, proper of human ‘capitalist’ and ‘nationalistic’ societies are not natural to the Universe; since the ‘poor’ and the ‘aliens’ are considered a ‘lower’ class coming from outside the organic system and destroyed accordingly. Yet *all men should be considered either informative or middle classes, never lower classes and receive enough energy and information to survive, since we all belong to the same species. And so according to the ‘3rd postulate’ of relative equality, we all belong to the same ‘organism of history’.* Indeed the higher and middle classes of any organism act together, as head and body of the organic system. Or else when the cells of the body of any organic system do not receive food, the body collapses and dies. *Which is exactly what happens in history when the ‘3rd world’ is treated as a ‘3rd expendable class’ by the ruling classes of the system, both inside and outside our borders and they rebel in revolutions and wars that destroy the organic civilization.*

Unfortunately the economic ecosystem spends most resources in the upper classes and ‘different species’, (technological machines and weapons), instead of keeping all the cells of the body of history healthy producing for them the

minimal human goods mankind needs to survive (food, education and health-care).

Yet systems survive because its cells are 'limited', existing between the central informative region that programs them and the energetic membrane that traps them and can kill them. In all systems, the stick and carrot, punishment and prize duality of negative and positive arrows provided by the 3 physiological networks control the 3 internal cycles of its cells, which have to obey the organic systems if they want to 'exist'; that is, to perform those cycles. So we often find 3x2 'elements' of positive and negative control, that structure a certain system as *the dual arrow of entropy and its 3x2 drives of negative and positive existence*.

A fact that explains why cells exist tied up in complex organic systems so well programmed. *Since according to organicism, the laws of the Universe are not imposed mechanically but through the will of 'existence' of its I-points, which make the best choices driven by their desire to process energy and information and survive*. A man, for example, can rebel at his own risk against the networks of power. You can obey an informative law and be rewarded or deny the law and be punished. But if the system punishes you it will extinguish you and another obedient citizen will occupy your place. So most humans always obey the law of its physiological, social systems. Yet if men, which are among the freest of all st-points, as they have self-consciousness, are so slavish; it is obvious that those points whose 'will of existence' is a vegetative or mechanical 'action', obey totally those networks. Physiologic networks rule indeed any biological organism to

the point that doctors consider most sickness caused by the malfunction of physiological networks, which 'extend' the sickness to the individual fractal cells they control.

Recap. In any organic system the dominant informative and energetic networks control and distribute its energy and information in 2 flows with opposite entropic directions: information orders of control are flows that depart from the dominant informative singularity towards the membrane across the middle class; while energy comes from the membrane towards the center. Both flows create together a dual structure of max. Space-Time force or Momentum, the fundamental parameter that defines the power of any organism (max. ExI). So together the dominant classes organize with their dual energy and information the fractal elements of the intermediate, middle mass zone or body. Finally the middle class will absorb, destroy and transform the minimal fractal units of temporal energy of the external Universe, or lower class, which is divided in small, disorganized fractal elements; transferring part of them to the membrane and center.

47. Temporal classes according to its existential force.

Let us consider the previous structure from the pure perspective of time dimensions by considering the informative, more evolved class, the future class - since it becomes reproduced in higher measure towards the future; the reproductive system, the present and the relative energy that dies and becomes dissolved as energy of the other two, the relative past, *since it will become extinguished*. To that aim we shall use the concept of existential force, which defines the survival and hierarchy of those 3 classes.

The networks in control of organic cells are topologically related to the 3 zones of any st-point. Both together define the existence of '3 social classes' with 3 clear temporal, organic functions in all systems of the Universe that we define according to its relative TxE force:

- *Max.I x Max E: The future, dominant quanta are the informative center or brain and the energetic membrane. In an organism, they are symbiotic and control the intermediate region: they absorb energy and information from the external world, passing it to the intermediate, 'middle class' region to replicate the specific temporal energy they need. In ecosystems they are the top-predator species and often establish Darwinian relationships, as men and lions do.*

The Universe creates fractal actions that combine energy and information, I X E. The informative center is the fastest geometry, processing information and the membrane is the longest entity, moving and processing more energy, their combined fractal actions Max. E x Min. I, are more powerful than the rest of the actions of the system. In ecosystems those cells work often in collective herds, which act simultaneously, joined by a common informative language that multiplies their fractal action, against disorganized forms. The result is a universal arrow of social evolution that creates from individuals to herds, and from herds, tightly packed organisms, directed by an informative language, since a herd is less efficient than an organism. So men have evolved socially in groups, hordes, tribes and tightly packed nations, controlled by legal and financial languages. Top predator ants and bees are the most successful insects, because they developed super-

organisms with chemical languages. In the Universe black holes fusion in bigger black holes that gather in the center of the galaxy, acting as 'gravitational animals' that perceive gravitation as information (as animals do with light), controlling with gravitational waves their stars. While stars are gravitational plants that absorb gravitational space-time as energy, as plants do with light and can't evolve informatively. Finally in the cell the informative RNA forms herds that control and organize their organelles with the genetic language.

-*E=I: A mass of present, cellular quanta form the intermediate region or 'body' of the organic system. It is the working, re=productive 'middle mass' that re=produces most of the complex elements of the organism under the orders of the informative classes. They are the workers of human societies that reproduce their goods under monetary orders. They are the stars of galaxies that reproduce their atoms. They are the herbivorous animals in the ecosystem on which carnivores prey. They are the electrons of the atom that gather electromagnetic light for the nucleus. They are the stars of the galaxy. They are the glandular cells that form the organs of a body and reproduce their substances controlled by the neurons. They are the proteins and genes of the cellular ecosystem. They are the citizens of a political system that obey the informative laws.*

- *Min. E x Min. I: Together the upper and middle, informative and reproductive brain and body prey and feed on the external, 'lower', past class, made of bytes of information and bites of energy of minimal size, which the other classes absorb from the external world or ecosystem, beyond the*

discontinuous limits of the world that becomes the ‘vital territory’ of the organic system in which it obtains its temporal energy to energize and inform themselves, destroying those lower, energy quanta in the process. The lower class tends to be an undifferentiated mass made of fractal pieces, full of energy with minimal informative perception: *divide and win*. They are plants on Nature; they are the stellar dust and dark energy that feeds and informs the galaxy; they are light quanta, carbohydrates and water in the genetic, cellular ecosystem; *they are* the machines of the economic ecosystem; they are those punished by the law in societies: criminals, enemies and emigrants, submitted to the racism of the other classes. They are the food and red cells of the blood system, without informative nuclei.

In Time the 3 regions establish a relative order from past to future, as the external, fractal forms that penetrate into the st-point are the relative past of the space-time field, which become destroyed and processed by the central region, the relative future towards which they move. So the central form is the future and the external world is the past. While in between those 2 limits, the intermediate region becomes the relative present of the system. In the galaxy, the black hole is the relative future of the stars than in the future will end up falling into the black hole; while the stellar dust is the relative past-energy they consume: $\sum \text{Min.E} + \sum \text{Min.I}$ (Past, energy class st-1) => $\sum \text{exi}$: Present, Reproductive class (st) => Max. Exl (Future, dominant, top predator Class: st+1).

IX. CYCLIC SYNCHRONICITY: PRESENT SYSTEMS.



The orbital, energetic cycles of the Earth-Moon system are parallel to the cycles of reproduction of its st-1 living fractal quanta: An organism extends through several scales of growing form. Since microscopic, fractal species become chained to stronger, Exl species as their relative energy and information quanta of a ‘lower class’. In the image, Gaia, the Earth’s surface, is a Fractal point, made of organisms made of Σ cells, made of $\Sigma\Sigma$ atoms, made of $\Sigma\Sigma\Sigma$ quarks, all chained by their organic cycles.

48. Knots of Time. Synchronicity cycles of existence.

If we consider any organism a knot of cyclical time arrows made of multiple feeding, reproductive, informative and social cycles with different frequencies and dimensional sizes, which converge in that organism, the next conundrum to resolve is the harmonic synchronicities between the I->E->R->S cycles of the organism. Each cycle will have a frequency in harmony with many other cycles, and so the being might be very complex in its behavior as it switches between cycles, but ultimately it can be reduced to a series of cycles that converge into the organism. Thus, organisms are knots of time cycles. In the same way, when multiple cycles converge into a point they

add their causal power and produce intense events with a higher $\sum e \times \prod i$ existential force, but we can break the complex entity into a series of cycles whose combined action will show a harmonic frequency, as we can break a harmonic wave into a Fourier series of simpler waves.

In this manner complex events/entities can be reduced to simplex herds of events/cells.

For example, the convergence of different geological and cosmological cycles, which affect the energy and information of the Earth, cause ages of extinction and age of massive evolution of new species, with a series of frequencies and rhythms we have studied in our analysis of geological biological and sociological cycles.

In fact most events of the Universe have multiple causes, which means they are knots of time cycles: from multiple cyclical forces that converge in Relativity to create a knot of gravitation or a charge, to the multiple events that converge in Biology to cause an age of extinction, to the multiple failures that converge in a body to change its rhythm from life to death.

Since the Universe explores all possible structures, despite being made of a few elements, the inverse system also exists: one in which the bigger system is simpler than the smaller, faster cells, and both are symbiotic, since the smaller cells equal the 'existential force' of the bigger system with more 'energy space' but less frequency of time-cycles.

Whereas the bigger system is: *Max. E x Min. I.*

And the smaller system is: *Max. I x Min. e.*

Unlike the previous organic systems in which the informative networks exploit selfishly and extract energy from the herd, big, slow forms and fast, small systems are symbiotic, in balance and so they last longer in time.

Still, even if there is a degree of symbiosis the bigger, single organic system will be in control of the cellular herds as it provides them with the ecosystem in which to obtain energy and information. And in this manner it creates the structural order and deterministic destiny of most systems in the Universe. Let us try to formalize such pyramids of synchronicity, with the help of the 3x3 time arrows, which dictate that an informative pixel is smaller than the superorganism of the perceiver; a bite of energy is smaller than the reproductive body; and a reproduced, self-similar cell is smaller than the super-organism of which it forms part. In terms of existence, it means that the life of a quantum, fractal part depends on the length of the cycle it performs for the bigger system that controls the fractal part through its networks and informative or energetic fields:

The shortest cycle is the *informative cycle* that absorbs energy particles, transforming them into bytes of information, perceived by a sensorial organ or mind. So informative particles are the smallest ones that live the shortest within any organism. For example, a human being consumes thousands of small letters in a newspaper thrown every day; an eye consumes a photon in a microsecond.

Next comes the feeding, *energetic cycle* that absorbs bigger energy quanta, transforming those quanta in 'cellular

components' of a body, once the informative cycles have perceived the food. And so an energy quantum lives a little bit longer than an informative cycle. A pig that feeds a man lives longer than a newspaper and also its 'final consumption' takes longer than reading that paper.

Then, it comes the *reproductive cycle* that handles huge amounts of energy and information to create a being, repetition of a bigger organism. A woman's ovule stays on her body all her life and it takes 9 months to become a baby.

Finally, the longest cycle is the being's *generational, social cycle*, from its birth to its extinction ($\pm st$) when it becomes part of an eusocial superorganism. So those cells that carry the 'social information' and I-eye-wor(l)d of a human being, our existential will, last longer: a man has the same neurons all his life. It is through that longer generational cycle how a new social plane starts to evolve, as a new ecosystem or macro-organism in which the being exists, as a mere quanta of the macro-being. Such is the relativism and justice of the Universe: since he who killed micro-beings to feed and inform himself will be just a micro-being that toils for a bigger organism.

It is the *social cycle*, as the quanta gathers in social groups to perform energetic or informative actions for the bigger macro-organism that lives in a longer scale of time and controls him. For example, if you are a soldier, your national organism will sacrifice you in an energetic cycle when the nation conquers and 'feeds on' the wealth of other nation.

Thus we establish a basic existential chain between the arrows of time and its cycles on 3 relative space-time scales:

(Informative>Energy cycle)_{st-1}>(Reproductive cycle)_i>(Generational-Social cycle)_{st+1}

- Since the existential, generational life-death cycles of st_{-1} particles become energy and information cycles for the st -being.

- While the reproductive cycle happens in the same st -level of the organic system that mixes with a couple of inverse exi parameters (sexual reproduction, inverse parameters of particles that reproduce a self-similar particle).

- Finally, the generational cycle of the being becomes, as a part of a social herd made of similar individuals, a submissive energy or information cycle of a macro-organic system, $st+1$.

Recap. Any organic system is a sum of $3\pm st$ types of cycles, chained in hierarchical structures across 3 levels of complexity. Any being's existence happens within those 3 TS *planes* in any organic system or ecosystem, in which he is a relative energy of bigger being, an equal, social being to its pairs and the informative master of smaller quanta.

49. Balances between scales Ternary principle.

According to the Ternary Principle any fractal, cyclical action of any species can be described through its spatial parameter of 'speed-extension' and its reciprocal, temporal parameter of repetitive rhythm or 'informative frequency', whose product, $ExI=K$ is a constant of action that defines the existential parameters or life-span of the cycle (also written as $ExT=K$ in certain models of physics, since 'clocks of time' and cycles of information are synonymous).

Yet those actions are the sum of the simultaneous micro-actions of its 'cellular quanta' and so both must be in balance for the total organism, extended in two planes of existence to work in synchronicity. And that synchronicity is ruled by the *black hole law of complexity, we just explained*.

Min.E=Max.I: smaller beings act faster than bigger ones.

How the faster, smaller, st_{-1} micro-actions relate to the slower, big simultaneous actions of the organism? Or in formal terms, what is the relationship between the constants of those macro-actions and the faster parameters of its micro-cellular cyclical actions? How each organism relates as an individual quanta to the slower, longer cycles, (Max. E= Min.I), of the $st+1$ ecosystem in which it performs its actions?

2 facts are the key to properly answer those questions:

- *Chains happen across 3 $\pm st$ levels of existence, creating hierarchical pyramids of unlimited size in time and space, through those ternary structures.*

- *Chains of actions become simultaneous, because certain cycles are shorter than others; so the faster speed of micro-cycles is compensated when we chain fast micro-cycles to slow macro-cycles.*

Consider the cycle of feeding of a lion. The lion moves through space in certain patterns that displace the lion towards hunting and drinking grounds where he will consume a victim. Thus the energy cycle will be determined both, by the inner vital constants of the ' st_{-1} cells' of the ' st -lion', (his cellular metabolism that defines his rhythms of hunger, his muscular

speed and his strength that determines the preys of the ecosystem in which he feeds); and by the outer, $st+1$ ecosystemic parameters, (the spatial distance and 'informative density' of preys of the ecosystem). So to define the 2 ExI elements of the lion's feeding cycles (the spatial trajectory and fractal rhythm of its hunting) we have to know those $\pm st$ parameters. Then we can define totally his feeding cycle.

Thus, existential cycles might be very complex but ultimately we can reduce them to a fractal ternary equation, which relates harmonically the Space-time parameters of those 3 $\pm st$ levels.

Those ternary chains define Universal events across 3 hierarchical planes of existence, from the chains that happen between the '3 social classes' of an organism, to the physical events that happen in 3 scales of matter, to the 3 levels of humanity (the biological, individual and sociological level). Since all cyclical systems are defined by the relative ExI parameters of those 3 $st\pm 1$ scales.

For example, Maxwell and Planck defined the informative frequency and energy quanta of a light photon that absorbs gravitational space-time energy and deforms it into a light-wave only with the action constants of 3 scales: the st_{-1} constants, or magnetic, spatial, and electric, informative constants of vacuum - $c=(e_0 \times m_0)^{-1/2}$; the st -constant of light (h) and the fractal, social constants of photons, as part of a bigger social, $st+1$ wave ($E=hv$). If we add to those synchronicities the understanding of the diffeomorphic dimensions of energy and information (on top), then we can fully grasp the structure of the 'organic membrane of light-

space' in which we live and its connections with the lower membrane of gravitational space and the upper membrane of electronic, denser space, of which our mental eye wor(l)d is made.

In most systems, a st-1 particle, despite its individual 'vegetative will', perform a cellular, cyclical function within the macro ecosystem in which it exists either as an energetic or informative unit, and in this manner the sum of the parts makes possible the emergence of the whole. In the previous example, photons are individual forms that feed on micro-electromagnetic constants creating a reproductive c-wave. Yet most photons could not exist if 2 bigger, st+1 atomic particles had not reproduced them to communicate energy and information, which is the role they performed by the higher quanta. In fact, the macro-organic dual atomic system that emits and absorbs the photon, determines its ExI, frequency and energy parameters and its generational life span, given by the distance between those 2 atoms.

Those balances between the cellular, existential force and individual force of the system is what maintains the balance of the organism and make it last in time and are exemplified by the previous Maxwell equation or the vital constants and physiological constants of an organism.

We can generalize those harmonies, observed in the lower physical plane if we consider a constant of action in any scale to be a self-similar definition of the Existential force of the system we can define a basic law of hierarchical systems:

'The st±1 existential forces of a system are in balance, such as the exi constants of action of the macro-system determine the length and intensity of the existential cycles of its cellular forms, which in turn will determine the cycles of its microsystems'.

Thus each entity will become deterministically chained by the informative or energetic, reproductive or social arrows of the upper system, for which it will act within a herd of self-similar forms, sustaining the actions of those macro-arrows of time. And so while submissive to the higher system it will enter in democratic, parallel relationships with the forms of its planes of existence and finally it will be itself, a super-organism for its internal cells or reproductive body it controls. This is the ternary principle that all systems of reality obey, from humans, which perform for his social scale, related in equal terms to other humans and control tightly the cells of their body, to the light photons of the previous graph, slaves of their electronic parents, of which they often become a 'fractal cell' (fractal interpretation of an electronic nebulae), while controlling the electric and magnetic constants of their space-time membrane.

We formalize those ternary functions as partial equations of the Generator Equation of space-time, to which we add the hierarchical index of scalar space-time, st:

- $\Sigma_{st-1} > I_{st}$: The being is a dominant macro-point, I_{st} , which absorbs a flow of information and energy from a herd of micro-quanta ($e_{i_{st-1}}$) that it controls with its physiological networks. So our cells are controlled by our blood and nervous systems.

- $\Sigma ExTi$: It is an individual quantum that relates to similar cells in an environment in which it searches for energy in social herds or for similar couples to attain its main existential will: its generational reproduction. Thus, 'st' is the fundamental plane of existence of any being, the region in which it perceives more, and plays its most fulfilling cycles of existence.

- $E_{st} > I_{st+1}$: The point becomes energy of the upper plane, either because it performs an energy function for a bigger social plane. For example, the govern controls you as a social micro-quanta of a nation, which makes you die in wars or takes your energy through taxes. Or because it is consumed as relative information or energy of the upper head or body system. For example, humans become soldiers, the energy of wars for the system called the military-industrial complex.

And again, to explain why all those processes, some paradoxical and destructive for the p.o.v. are possible we must postulate a conscious universe of infinite, relative p.o.v.s.

In fact, and this is a 'psychological law' with enormous implications for the existence at least of human beings, which might happen in other scales if the hypothesis of a perceptive Universe is truth, *most points of existence are completely unaware of the existence of a lower scale, which they ab=use and they actively sacrifice themselves from* the upper system from which they receive orders and information in its 'tabula rassa' brain. Since the p.o.v. has far less information than the upper system, which programs it to love its master. So humans go to wars for the military-industrial complex without realizing

they are sacrificing themselves in most cases for the financial gain of the upper, informative castes that control with money, weapons and law the society in which they live.

It is an order we find in all planes of existence. For example, in Biology, a st-mitochondrion uses st_1 protons to deliver energy to the bigger organic st+1 blood networks in the form of ATP. So the atomic, cellular and organic scales define the energy cycle of cellular breathing. While a star turns in cycles with other stars, feeds the galactic black hole as a quantum and feeds itself in fractal stellar gas. A light ray feeds on electric and magnetic constants, gathers socially in photons and it is absorbed by big electrons.

Recap. From that 3-scalar order that structures any particle or cycle of existence (static or dynamic perception), it arises the *relativity of existence, as any being* is king of its territorial hill, friend of its friends and slave of the World or ecosystem in which it exists.

50. Laws of hierarchical synchronicity between time arrows

The relative frequency of those cyclical arrows create 'time clocks' whose synchronicities chain the long cycles of fast micro-entities to the short cycles of a slower macro-entity, creating a harmonic order between the different planes and social classes of the organic Universe. Since an informative cycle is faster than an energetic cycle, which is faster than a reproductive cycle, which is faster than the complete generational cycle of the being; while a macro being is slower than a micro-being, we write 2 basic chains between those

cyclical arrows and the beings that carry its parallel functions in the structure of a superorganism:

$\Sigma\Sigma$ *Microcell's Informative cycles* = Σ *Cell's energy cycles* = *Organism's Reproductive cycle*

$\Sigma\Sigma$ *generational cycles of microbeings* = Σ *Social cycles of Beings* -> *E/I cycle of macrobeing*

Those ternary chains between the fastest cycles of macro-beings and the slowest cycles of its micro-beings *create simultaneous, symbiotic actions along 2 planes of existence.*

Informative frequency of the macro being => *Energy frequency of the micro cell*

Thus the fast, informative cycle of the slow macro-being is transformed into the slow energy cycle of the fast cellular micro-being, in a symbiotic chain that make it dependent on that macro-being. For example, the fastest Earth's cycle is its informative, cyclical rotation as a mass vortex that determines the day-night cycle of light, which feeds its living beings. So, the living st.₁ cells of Gaia, its plants, feed with the day light, while its st.₁ animals have a ternary energy cycle of 1 to 3 meals a day. So both are timed to the informative light-day cycle of the Earth, their energy cycle. If we lower the scale of analysis, the same cyclical chain happens between the animal and its st.₁ cells. Men have a rate of informative perception of a second, the rate of blinking and thought. But a second is also the rate of breathing and the heart's beating that transfers energy to its st.₁ cells, becoming thus the energy rate of feeding of those cells.

The same relationship can be used in other informative /energy cycles. For example, the energy cycle of an animal is a day. Yet the size of its hunting territory, of which he knows all its information, is the distance it reaches in a day.

A homologous relationship chains microcosms and macrocosms symbiotically in the next, longer 2 cycles, the energy and reproductive cycle:

Energy frequency of the macro being => *Reproductive Frequency of the micro cell*

By homology with other organic systems, we consider that the energy cycle of the Earth as a rotational mass that deforms gravitational spacetime lasts the year it takes to cross its space-time territory, its orbit. Since, as in the case of an animal, the main energy cycle of the planet is the year-time it takes to sweep its solar orbit, the 'organic territory of the planet', where the Earth absorbs its gravitational energy, deforming space-time according to Einstein's equation. While the secondary Earth's energy cycle is a month in which its satellite, the moon, sweeps around the Earth's orbital territory. We obtain thus, the 2 main cycles of transformation of gravitational energy into rotational form by the Earth-Moon system: the lunar cycle and the annual cycle.

And those 2 cycles are transferred to the micro-living beings of its Gaia skin, so they are the reproductive cycles of most animals. Thus in the human being the menstrual cycle is a lunar cycle; the cycle of reproduction of a child lasts 9 months; in Nature almost all reproductive cycles have an annual frequency, happening in spring or summer, when the sun's

light absorption is maximal; which is the obvious reason why those cycles are linked: while the macroscopic being absorbs energy, it allows its cells to use that energy to reproduce. Again, if we lower our scale, an animal as a macro being has a cycle of energy of a day. That period is also the cycle of reproduction of most cells, called mitosis. Yet reproduction is discontinuous: it happens only when ‘optimal energy and information’ is available during a small interval of the total existence of the being, in general in the second, mature age of balance between energy and information.

It seems that the micro-being is fed and reproduced by the macro-organism, the good ‘god’ of its existence. Yet ‘the good god’ is actually a farmer that reverses its arrow of order for an arrow of entropy and destruction when it uses the ‘existential cycle’ of the micro-being as a mere fractal cell of its macro-organism. So we feed and reproduce pigs but end up eating them. In a sense, we can say that all organisms are ‘farms’. So pigs feed men; stars fed by the interstellar gas attracted by the black hole’s gravitational power, also end up feeding the black hole; and fat cells fed by the organism end up killed, feeding the macro-organism. So in that inverse, final cyclical chain between the microscopic and macroscopic being, the ‘relative God’ takes all what he gave. Thus there is an inverse, final chain between the generational cycle of a micro-organism and an inner, energetic, informative or reproductive cycle of a macro-being. Thus the generational cycle of the macro-being complete the previous chain:

Generational frequency of micro cell => Reproductive frequency of macro being

For example, body cells live and die in an interval between a month and a year, which is the period most animals need to complete their reproduction. At cellular level, carbohydrate molecules live and die in short daily cycles, which is the period of reproduction of cells. The relationship between both cycles is again organic: reproduction means the renewal of a macroscopic being that destroys and creates many of its fractal elements, as energy or information of the reproductive cycle combined cycle. So cells accumulate carbohydrate molecules that they use in their reproductive processes, destroying and reconstructing its DNA genes with them.

Depending on the role a st-1 quantum performs in the macro system, its life will be longer or shorter: Wheat is harvested to feed annually the human ecosystem, while carbohydrates die every day to reproduce DNA molecules. Yet a top predator informative cell, a neuron, lives the entire life of the organism, since it defines the informative networks that dominate and form the will and consciousness of the organism as a whole macro-beings. And inversely, the life span of the ‘brain quanta’ defines the life span of the macro-organism. So probably the enormous life span of quarks, the fundamental particle and brain of the fractal atoms of the Universe, defines also the life-span of the Universe. Since the study in detail of all those chains for all Universal species is beyond the Cyclical Time of this work, we will only consider some examples from the 3 main disciplines of science:

- In the physical world we study the temporal chains between the 3^{±st} scales of existence of light (gravitation, light and atoms) and the 3^{±st} scales that create the Universe.

- In Biology we study chains between the $3 \pm st$ scales that cause life evolution: the st_1 genetic cycles, the st -life cycles and the $st+1$ ecosystemic, geological cycles of the Earth.

- In History we study the rhythms of life of civilizations and the human generational cycle, which follow a decametric $80 \times 10 = 800$ cycle of destruction of civilizations.

Recap. Since the life of a fractal cell or quantum of a bigger system is a moment in the longer existence of its organism, to create the effect of simultaneity, microcosmic, fast, fractal cells have to chain their longer 'existential cycles' to the shorter cycles of a bigger organism or ecosystem in which they will exist as a mere fractal instant of those shorter cycles. Thus, the informative arrow is smaller and determines the energetic arrow, whose frequency is shorter and determines to the reproductive arrow, whose cycle is shorter and determines the eusocial arrow: $I \rightarrow e \rightarrow r \rightarrow S$. As a Hindu proverb says: 'a blink on the eye of Vishnu, the Universe, is a life of a planet and a drop of sweat of a planet is a life of a human being.'

X. COMPLEX TIME SPEEDS: PALINGENESIS

51. 3 types of reproduction: Fractal space-time jumps

A theme which might seem of science fiction to the reader, already surprised by the innovative outlook on reality provided by Time arrows and space discontinuities is the displacement not only in 'space size' but also in time evolution between the different planes of reality and the consequences for the workings of the Universe.

We affirmed earlier that all spacetime motion was in fact, in a discontinuous Universe, an act of reproduction. So a wave moving was a reproductive form, imprinting a lower scale of forces (in the case of light the gravitational membrane) with its information. And we distinguished 3 types of reproduction: external, enzymatic reproduction, from a 'relative past to future', as the parts were assembling into the whole by an external factor (enzymes in cells, human 'enzymen' in machines); a relative, present reproduction, as in the case of light, since the reproductive act was fast and displaced a wave-form in space, and a palingenetic reproduction from future to past, when a superorganism emitted a relatively less evolved seminal cells from the past that would then recreate the being.

The readers should be aware that when we classify self-similar processes almost always we come to the conclusion that there are 3 types of 'differentiations' or 'decoupling' or 'horizons' or 'ages' or 'subspecies', in as much as the Universe is structured in ternary patterns, according to the 3 dimensions of time, past, present and future and its 3 equivalent topologies of space, past=energy=spherical plane,

present=reproduction=cyclical, toroid and future=informative hyperbolic topology.

In the case of reproductions, we used the dimensions of time to classify them. Yet the fact that reproductions are informative actions related to time more than space (except in reproductive, present motions as speed is), means that reproductive acts provoke a ‘time jump’, a ‘time displacement’, not only a spatial displacement.

Because reality is webbed by groups of actions that form strings that form particles that form atoms and so on, there is a dilation in time between the creation of lower, simpler planes, done in a relative past respect to the higher, more complex planes, which use the smaller particles of the past as energy points of its topological creation of new scales of spacetime. Yet in the same way we humans do not distinguish the age of galaxies we think are happening now when we see them millions of years ago, the time the light takes to arrive to our universe, when we see cells and atoms and other scales of reality we tend to believe they co-exist simultaneously and yet they don’t. There is a temporal displacement according to which the ‘future’ is the place where the most complex levels of organisms exist and the past where the simplest planes are formed. So your consciousness as a whole is displaced in time compared to your simplest atomic particles.

Thus in time jumps to the past, the species that emits the information *does not emit the information in the same point of present in which it exists, but since information is discontinuous, the cellular bit of information appears in its*

immediate, lower spacetime-point, in its relative past, and so it suffers a discontinuous displacement in time.

Indeed, imagine a Universe with 2 dimensions in a complex plane, you can go left or right, meaning that each fractal step you do you will move through a discontinuous ‘jump’ to the lateral space. This happens because as we said, when resolving the paradox of Zenon, motion does not exist in the Universe, because it is always a discontinuous reproduction of a form. So when a light moves, it doesn’t move; it imprints the gravitational space next to it with a self-similar form.

Further on, we have explained that time/information is really a displacement along a ‘dimension’ of height and we represented temporal information with a complex plane.

So when we move to a lower scale of information, we are moving in ‘the time clock’ of the super-organism a cellular step down, which means within the whole organism we move to the past. We shall thus enunciate the law of fractal time jumps and analyze the 3 examples of the previous graph: a physical jump to the past (particle/antiparticle pair), a biological jump to the past (birth and orgasm), and a sociological jump to the past (the function of the prophet in a corrupted, dying social organism of history, a ‘God’, subconscious collective or civilization). And two other fascinating cases: the spooky effect of quantum entanglement and non-local gravitation in physics and the question of will and consciousness in human beings.

Let us then enunciate the law of fractal jumps in timespace:

'Fractal jumps are reproductive motions in time and space. Spatial jumps happen in spatial steps with a maximal length equivalent to the length of the organism, between contiguous zones of the same space plane. Temporal jumps happen as temporal displacements between 2 hierarchical contiguous planes - st and st-1 - of informative complexity with a maximal length equivalent to the generational life cycle of the st-1 cell of the organism.'

Spatial displacement dominates motions in the same plane of existence (hence reproductive motions). The main time motions between planes of existence are jumps between planes which imply a change in the parameters of energy and information and a jump in the point of space-time in which we exist. Those laws, unknown to science, are the most important of Fractal i-logic and are tested by thousands of detailed analysis in each science. In essence when we move from one plane of existence to other planes we do not only displace in space but literally in time, because reality is constructed not only with a volume of space but a volume of time information.

Thus, the Universe only allows one 'discontinuous jump' to the next past, future, right or left zone. There are not worm holes to enter far away Universes (too far to happen), jumps to a past in which mother was born (as only you travel to your past through your death).

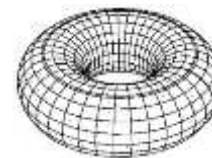
Because physicists use a single space-time continuum and confuse the arrow of time/motion/energy with the total time arrow of the Universe, some believe that a change in that time/motion arrow, which is merely a local change in the

direction of a fractal entity of space-time, is an absolute change in the direction of all the arrows of all the beings of the Universe. This is the reason of some naïve ideas about time travel in physical systems that halt the motion of time (Black holes where the T parameter goes to zero, which prompted Mr. Hawking and Mr. Thorne to affirm they are time machines). Time travel doesn't exist because all arrows of time are local, belonging to a fractal system of the Universe, NOT to the entire Universe, and physical Time Arrows are changes in the motion of beings, not changes in the arrow from past to future.

Let us now consider first the most complex type of reproduction, from future to past or palingenesis and then, the reproduction from past to future, departing of parts (genes in biology, memes in sociology) that construct a future super-organism, as we studied already the reproductive waves of present-space (light waves and motion in space).

Recap. There are 3 types of reproduction: a past to future motion or 'genetic' reproduction; a present to present motion or reproductive speed and a future to past reproduction or palingenetic, parental reproduction. All of them are based in the symmetry between space and time, two types of geometrical motion and the fact that all motion in space-time provokes a displacement both in space distances and time dimensions.

52. Dimensions and reproductive motions



Time cycles reproduce through fractal dimensions. Imagine a torus, as the one depicted in the graph: A cyclical string turns around, creating every 3

movements a self-identical closed macro-torus. If we repeat the process 3 times we obtain a 9 dimensional self-similar fractal super-string. Such is the way in which the Universe, departing from some basic forms - torus, spheres and lines - self-replicate and grow invariant at scale its energy and information systems.

Since according to the paradox of Galileo, what we perceive as still space is in perpetual motion, 2 questions must be solved:

What is moving and what is fixed space? And how movement can be introduced in the simplified, mathematical static models of time and space, proper of the Cartesian plane that scientists use to describe the Universe? Both questions are related to the concept of speed and acceleration as a 2nd and 3rd dimension of motion, and hence also as the 2nd and 3rd dimensions of fixed space. *This insight has deep implications for the meaning of Physics and the interpretation of the Equivalence Principle of Relativity in which Einstein based General Relativity, his theory of mass and gravitation. So we shall try to explain it in more detail.*

Since acceleration is mathematically defined as a new motion applied to speed, a constant motion, it follows that an acceleration/deceleration, $a=\pm v/t$, is both a dual motion and a bidimensional form. So we can either consider a static line which becomes a plane and then a cube, or a static form that moves with a speed and then accelerates. Thus, the dimension of acceleration/deceleration becomes the 3rd dimension of physical time and the more complex of all, as it includes the

other 2 types of time-change in physics, speed and spatial form (in the same manner a cube includes lines and planes).

We can see a dimension of time movement as a spatial, fixed form, when we see it in simultaneity. So the 3 dimensions of space can be derived in time, by moving a point into a line, a line into a pane and a plane into a volume, and what we have termed as the 3 dimensions of physical time-change, in-formation, movement and acceleration, can also be derived from space by observing the curvature of space, and deriving that spatial form in time, $v=ds/dt$, and $a=dv/dt$. So time and space are not only inverse but complementary as we derive the 3 real dimensions of time from space and the 3 dimensions of space from time. This can be done in two different ways, with the geometries of lineal space or the geometries of cyclical clocks of time:

-A point can become a lineal string, which can reproduce laterally and then the plane it forms can reproduce upwards, creating an Euclidean cubic space.

- A point can move as a curve to form a perimeter which can rotate to form a sphere.

The difference which has important implications for more complex analysis of physical space-times is obvious: the point needs two paths to create a hollow 3 dimensional sphere; while the lineal approach creates a dense, non-hollow cube in 3 steps. Informative spheres are thus bubbles which tend to shrink and implode, weaker than the more solid cubes that fill the entire space without leaving 'dark worlds'.

In other words, the minimal gravitational membrane of the Universe is a lineal membrane, filled totally by lineal reproductions (string theory), because they must be the ultimate web, filling all reality (or else what there is inside), but most formal creations over that membrane are particles with hollow dark spaces.

Motion as reproduction of form, the stop and go game.

All this comes to a fascinating fact that explains both the paradox of Zenon and the paradox of Michelson's measure of speed: motion in time is a reproduction of form in space. And so reality is webbed as particles with forms, go fractal step after fractal step, imprinting with higher form the previous, lesser informative, faster, $v=s/\text{information}$, membrane in which they are shaped. As in a film theatre, where you move the image, stop it, emit light to create a form in the screen, move on, stop, emit information, the Universe of motions is made of reproductive, fractal motions, steps that imprint form in the lower scale of energy. And so reality is always a stop and go, confirmed by the trajectories of particles which are always erratic, with stops and goes and 90° angles, when they emit a smaller particle to communicate. This also explains without need for a c-absolute postulate of speed why Michelson didn't add speed to a light emitting electron travelling in medium: the electron stops, locks itself in the gravitational membrane with the other electron (entanglement) and then in stillness emits its photon. So the speed of light of the event is independent of the speed of the background an emitter and receiver are locked before they share information. When you talk you also align your head in the direction of the speaker. Your head is your

fractal point and the voice you emit is locked in distance. Or else it would suffer a redshift or echo effect.

Thus, time motion is not a mathematical, geometrical pure dimension of space (Relativity latter revis(it)ed in more detail), but the first dimension of physical space, of the real world that Euclidean geometry converts into a fixed abstraction.

In that sense, from the perspective of time physics, we could temporalize space and then consider that the first dimension of time is in-form-ation, morphological shape, achieved by the evolving height growth of any form, from masses that evolve in height till becoming black holes to biological life that evolved in height from the planarian to the human being. The second dimension of physical time will be reproductive motion of form of those 3 space-time dimensions that create a 'fractal dimension' that extends till the end of that movement. And finally the 3rd dimension of physical time-change will be acceleration, change in the rate of speed. If we add the inner bidimensionality of the mass vortex or bit of information reproduced with those motions, we have 5 fractal dimensions.

No more dimensions are needed, as it can be proved that the maximal spatial volume and hence the maximal efficiency in packing a space-time field is achieved with the folding of 5 dimensions, which might be the dimensions of the most informative, temporal elements of the Universe, black holes whose equations transform spatial dimensions of length into time dimensions of infinite height.

It has in fact been proved by Maldacena in his famous conjecture that the 4-dimensional membrane of a 5 dimensional

Universe is self-similar. Thus, we could consider that a local big-bang quasar or a cosmic big-bang would be the external membrane, which unfolds of a 5 dimensional Universe. This is rather accurate. Since we observe a planar Universe (from our 3 dimensional perspective) which could be the energetic, Riemannian topological membrane of any st-point.

The error resides in considering all those 5 dimensions spatial dimensions instead of temporal dimensions of movement and acceleration, a subtle but fundamental change that explains a vital reality, 'as it is' beyond simplistic, geometric abstractions.

Reproduction of light: motion as form.

We hinted before to the fact that the simplest space-distance or amplitude of a wave and the simplest information or frequency of a wave, combine creating the simplest constant of action or speed, the speed of light or electromagnetic space-time, which reproduces the form of the wave across a surface of gravitational space. So the abstract spatial term, 'speed' is for light waves an organic arrow that reproduces the in-formation of the wave in the previous energy of space, in the case of light imprinting the simplest gravitational space-time. Light speed becomes then the 3rd arrow of reproduction of a dimension that combines energy and information, recreating a new form. We can find many other examples. Since the combination of the arrows of fractal information and spatial energy define in the complex Universe the 2 new dimensions of existence, reproduction of a parallel form the same plane of space-time and social evolution of self-similar forms across multiple planes of space-time or palingenesis:

3^d Dimension: Spatial Reproduction: ext=k.

4th ±st Dimension: scalar, palingenetic, social evolution

It is important to remember that those 2 complex arrows exist with lesser frequency than the simplest ones, energy and information beats and have self-similar rhythms. So if the simplex beat of reality is the stop and go of informative perception and energetic motion: I->E->I->E, the complex rhythm is also a beat between spatial reproduction (a radiation in biological beings, a wave in physical species) and informative evolution (a collapse of a wave into a particle):

Social, Formative evolution->Spatial Reproduction->Evolution

And it is easy to see that social evolution is the complex arrow of time and information, as it requires a lot of time and a common language of information to create complex social networks; and reproduction is the complex arrow associated to energetic processes, which must be observed to be able to reproduce. So for example, a female without a percentage of fat in the body cannot reproduce and when a species radiates in a massive age of reproduction, it does so, often extinguishing a previous species in which it feeds on.

They are also dimensional arrows, that the dual, geometric and organic nature of the Universe. Indeed, if height is the natural dimension that orders the information of the Universe and length the natural dimension in which spatial energy extends and moves, the combination of those 2 arrows of

energy and information produces reproductive waves that create the 3rd dimension of width.

Reproduction of waves and forms that create new dimensions becomes then the biological why of the geometrical hows we observe around us.

Yet further on, there is a 4th dimension of growth into macrocosms that structures cellular reproductive waves through an increase of informative frequency. So the collapse of a physical wave when it grows in frequency/form, make it transcend into electrons and other particles of higher information. And inversely, a light wave that relaxes and diminishes its information and frequency (redshift) ends up tired, descending to the lower plane of gravitational space-time.

It is the combination of those 2 complex arrows what allows palingenesis - complex reproduction. Thus a palingenetic cycle is the essential reproductive cycle of most forms of existence, in which the interaction of both complex arrows/dimensions creates $st=1$ waves of microforms that become macroforms, by the reorganization and growth of self-similar reproduced sets. We might say that palingenesis is a temporal reproduction in as much as it moves little in space but evolves a lot of temporal information - while speed or translational movement is the spatial reproduction of a simple physical form across space. Thus the reproduction of dimensional forms creates reality.

The simplest of all those dimensional, reproductive waves is a c-speed, reproductive wave of light, which Maxwell proved to be the product of the magnetic/energetic and electric/informative constants of the light wave ($1/m_0 \times e_0=c$).

Galileo's Paradox makes us perceive such moving, dynamic, reproductive waves as continuous dimensions of space. Both perceptions describe the same dual reality: a space-time field in perpetual transformation. The most striking case of one of such space-times made of organic, dimensional networks is the electromagnetic space-time, which forms the background of human existence, our space-time perception. Since human space-time is not an ideal, Cartesian background, but it is created by the fractal sum of all the 3 perpendicular dimensions/networks of light-spaces (the sum of all light beams of the Universe). The 3 dimensions of each of those light fields are perpendicular as our Euclidean space-time is, and correspond from the perspective of light to the 3 organic cycles of a photonic wave: the c-speed or length of a light field reproduces its form, the magnetic width acts as the support energy of the light wave and the electric height creates the information of light, where the photon or informative particle/head of the energy wave/body of light is found. When such light waves reproduce, they create a wave of present space. Since the light wave transits in an eternal present, or in other words it doesn't change its content of temporal form, its information is preserved. For that reason spatial, light waves transit billions of years between galaxies carrying accurate information on the far away particles that produced them.

Thus movement is no longer movement but the reproduction of a form over a surface of energy. Light doesn't move but its waves imprint the form of gravitational space with the wave of light. An electron doesn't move but it shapes the photons of its electronic space in certain wave patterns, called the electronic

nebulae. Masses are not fixed forms but vortices that bend lineal gravitational space once and again into self-similar fractal, temporal cycles. In those terms, a dimension of space is the reproduction of a volume of discrete, fractal, self-similar in-form-ation that creates space.

While inversely, temporal palingenesis reproduces and evolves information.

The Universe is not only in perpetual movement, transforming back and forth lineal energy into cyclical form, but also a perpetual self-generating organism that constantly reproduces logical forms in palingenetic cycles, between $2^{st} \pm 1$ scales of relative space-times, where a mother will transfer its form into a micro-mother cell that through a process of palingenetic reproduction will create a self-similar replica of the mother.

Speed and palingenetic reproduction of a form into a fractal space surface explains from quantum jumps to palingenetic reproduction, from mystique experiences to the nature of dark matter, from Relativity to logic paradoxes. For example, the oldest paradox regarding movement is now solved: how can exist in a fractal world filled with discontinuities continuous movement? Zenon, a Greek philosopher put the example of Achilles and the Turtle: Achilles will never reach a turtle because he has to cross infinite fractal spaces. Parmenides gave him the only logic, true answer: continuous movement doesn't exist in a discreet Universe; it must be a mirage of the senses. But we observe movement, so how it can be possible? Because movement is an action of palingenetic or wave reproduction.

Since a wave, as the figure shows, is not really moving, but reproducing information over the potential energy of the next vacuum space in a sequential, fractal jump, through a series of wave-lengths, drawn one after another, which appear to the senses as a moving wave. Movement is always a discontinuous displacement in space and time, through the reproduction of fractal information. The simplest analogy is a television screen where new images are created constantly without hardly any cost of energy, because they are virtual images formed by illuminating 3 colors that are already potentially in the screen. In the case of a wave, the relative energy imprinted by the logic form might vary, from the vacuum energy of a light wave to the placental energy of a mother, yet the process is always the same: a form imprints another region of space, changing its morphology. What matters in the Universe is the dominant arrow of information, the logic, intelligent form, which imprints constantly amorphous surfaces of energy. The Universe conserves forms over eternal moving energy. Even the most complex, fractal, living organisms, made of ∞ cycles that transform energy into information back and forth, maintain the appearance of a constant form, because they constantly repeat those biological cycles over new energy elements. For example, a human changes all his/her atoms in 3 months but s/he maintains its biologic form invariant, thanks to the constant absorption of new energies over which s/he reproduces his/her fractal information. Bidimensional cycles of time and planes of space are fractal and so are their changes and displacements. Thus since time is geometric, bidimensional, as space is, it can imprint form in any lateral surface of energy, giving the false impression of movement. So

speed is synonymous of reproduction, the main cyclical action of the Universe, where now the ideal Galilean Formula, $V=S/T$, for a fixed space-time, applies to the real variables of Spatial energy and Temporal Information: $V=\Sigma E/T_i$.

Self-reproductive waves create what mathematicians call fractal, finite, self-similar dimensions, caused by a wave that repeats its patterns of information in diminishing or growing scales. Which is the key process to understand why energy and information are invariant shapes at scale, repeated ad infinitum from atomic to galactic cosmos: fractal waves translate those morphologies, as they change, grow or diminish in spatial size/speed and T_i -frequency, connecting different space-time fields. Those waves of energy and information cross the discontinuities between different space-time fields. So when we look at smaller Universes from our perspective we use an electronic or light flow, whose frequency increases as we enter those smaller, more informative Universes.

In that sense, following the Correspondence Principle, the new concept of 'informative speed', $V=\Sigma E/T_i$, includes the simpler model of spatial speed. Yet it goes further, explaining not only the how but also the why of many laws of science, relating the energy and information of waves with its relative speed, since according to the inverse properties of energy and information, the less information a wave has to build up and reproduce, the faster the wave will move. This is called in Physics the Law of Range of Forces ($\max.T_i=\text{Min.}\Sigma E$) and it has its limit in the non-local, instantaneous speed of gravitation, which carries zero information and has infinite speed: $v(g)=\Sigma E/0$ information= ∞ . While in the other extreme

it creates fixed frames of gravitational reference, called black holes, which carry infinite information and have zero translational speed, as entire galaxies turn around them. It was again Aristotle, who said that if God exists, it would be the final unmoved focus that in-forms the movement of all other beings in the Universe. Indeed, the black hole seems the God/Brain of in-form-ation of all galaxies, whose stars turn and fall into it. The Universe itself might be born of the big-bang explosion of a black hole, origin of the process of Universal life that will end in the reverse 'Big crunch', of informative death, creating the ultimate cycle of existence of reality...

Recap. The dimensions of space are reproductive arrows of time that imprint a form in a simpler energetic membrane. Worlds can have a maximal of 5 dimensions: 2 bidimensional forms which move in 3 fractal dimensions of a higher Universe.

53. Does st-1 determines st? Genetics & memetics

The simplest act of reproduction and creation is the assembly of parts that become wholes, and its study gives birth to an entire sub-discipline of systems sciences called *Emergence*.

The structure of the Universe is that of a series of complex worlds/organisms of at least two membranes, one of relative past, energy, st-1, and one of relative future information, st+1, with an intermediate present st-membrane, exi, made of actions (equivalent to the topological description of relative past, external membrane, r, a relative hyperbolic center, a, and an intermediate cyclical space with motions between the a-r limits, which form together a 'closed ball'.)

In those systems an external perceiver tends to observe mainly the intermediate space with maximal space volume and misses the hyperbolic informative center of minimal space, *even if it is the source of informative orders, through invaginated networks that control both the Riemannian, spherical surface and the paths of the cyclical cells in between.* Yet the flows of energy move from the ‘lineal quanta’ of the surface through the paths of the internal body-organs into the hyperbolic, informative structure. And so human scientists that need instrumental ‘pictures’ to prove the existence of a causal order and only use Aristotelian single causes tend to believe in any ternary structure that the ‘lower energy plane’ is the case of the creation of the superorganism.

This means we consider in the ternary structure of a human, (cellular, individual and social structure) that st-1 genes to be the cause of all our properties as a super-organism, and we are just a ‘ghost’ created by them. But this is a partial vision due to the limits of perception of informative orders from the hyperbolic, fractal informative system – the nervous system - to the lower, genetic cell system. If, in the future we get to fully understand the networks of information of the brain, we shall certainly discover that many orders and structures of the human superorganism are stored in the brain and probably reproduced during the last months of gestation from the mother’s brain to the brain of the child. Moreover, there are an infinite number of personal traits which are NOT reproduced through Genes, but through the carriers of information of st+1, cultural organisms, called memes. Indeed, most of the features of our life – our religious beliefs, cultural customs, laws and instruments are

memes, which create another super-organism, the civilization or religion, in which we are a mind-cell, a believer, who shares with all other believers the same ‘mental DNA.

So in this case, if we were to accept the thesis that creation happens from the lower level to the upper level, we should consider that we, human beings, are the only influence on the memetic structure of civilizations. But it is obvious that once those structures are created they influence new generations. So for example, when a system of laws or beliefs in a legal nation or ethical religion is created, it reproduces from generation to generation, influencing and molding the new species.

We conclude that superstructures & physiological networks, the informative/nervous/cultural system in organisms and cultures and the reproductive/blood/economic system, once constructed, influences the lower genetic/human scale. In the genetic case we do not know how. In the social structure, we know and since the work of the socialist, scientific school of history and the recent development of memetics and biohistory, we have worked out the processes – even if most historians prefer to think that we, individuals are the heroes and only cause of historic events.

But what truly matters is that both genetics and memetics are bytes of information whose purpose is to create a superorganism, as the biological and sociological superorganism of mankind have the same physiological structure with nervous/informative /cultural systems; blood/reproductive/economic systems and digestive/energetic/military and transport systems.

So the true program that genes and memes and any 'informative bytes and parts of any creative process' follow is the arrow of eusocial evolution, which explains why so smallish 'genes' and 'memes' are able to reproduce so complex super-organisms, as most of the development they will express is 'structural' to reality, embedded in the existence of a 4th arrow of time, eusocial evolution; which in itself is the natural conclusion of a game of 2 simplex energy bites and information bytes, which reproduce in 3 types, more energy bytes, more information bytes and reproductive combinations of both, which latter will recreate energetic, informative and reproductive systems. So genes and memes do not need to encode that program/information that happens automatically. Moreover because each bit and bite has embedded its program within itself as part of the space-time reality, it will naturally search for energy and information carrying the program. For example, humans naturally want more energy for their body and more information for their mind, so naturally they try to create machines of energy (transport, weapons) and information (chips, books, audiovisual machines, mobiles) that enhance their capacity to process and store energy and form.

It is thus logic to think that in the genetic scale, RNA molecules which are the 'active' elements of the cells, carry a natural will for more energy, information and reproduction, which they 'express' creating cells and then superorganisms, as we humans do through memes, even if we are not conscious that the final outcome of our labors is the creation of nations, religions and civilizations, superorganisms of history.

This is indeed evident when we study the behavior of RNAs, which do the cycles between the outer Protein, lineal membrane and the DNA-informative storage, and are divided in 3 sub-types specialized in energy/killing, reproduction/RNA messenger and information/transcription.

In essence all this means there is not only a 'biological arrow' of creation of the upper scales of reality as a construct of the lower scales of genes and memes (the dominant theory in biology, due to the excessive development of genetics); but also a present flow of orders, embedded in the program of the 6 arrows of time, masterminded by the 'action units' of the system (RNA molecules and human beings) in both scales, which is probably the dominant 'will' of the program. And also a stored, informative, repetitive flow of orders and information from the upper scales of reality to the lower scales, which geneticists have not yet understood, due to its complexity (nervous structures in organisms and 'the system' or 'superstructure' of cultures and economic ecosystems in societies). Indeed, the codes of the brain that might determine certain characteristics we cannot obtain from genes is more difficult to recognize, as information tends to have lesser size and it is coded, so an informative order is often invisible to those who don't understand the language in which it is written.

What parameters define different creative processes? The specific forms of the informative stores (DNAs, nervous networks constructed by imitation of the mother's brain by the son's brain and cultural memes). They differ in each superorganism, which will activate and create a different type

of transfer-RNA, animal nervous system and individual memetic brain, reproducing a different species and culture.

Further on, a theme which must be taken into account is the fact that all those systems seem to us ‘simultaneous’, despite the fact that they are displaced in time, since to recreate the upper scales, the lower scales must be created first, so the superorganism is displaced into the future. And for that reason for the 3 scales to create a ‘simultaneous present’, synchronic being there must be indeed a time jump or flow from future to past of the superorganism or relative future structure and a flow from past to future of the cellular energy, which will flux into the relative present, so the 3 ‘scales’ are in harmony and co-exist creating reality: Past x future = present.

In a world of multiple time-speeds and planes of existence we live in an ecosystem of time knots whose cycles of time/information differ in parameters of energy and form and are displaced from past/energy/simple cycles into future/information faster cycles. Yet the faster cycles are built upon the previous structures and so they are made ‘after’ the simpler cycles are created, in the ‘future’ There is therefore a real displacement in absolute time between what we see as bigger structures and what see as a smaller, since the bigger structures are traced departing from smaller cycles. This explains a mystery of quantum physics – the fact that we cannot see the wave/past/energy state and the future/particle state at the same time. Neither we see the atomic/past state and future /molecular pi orbital at the same time. *And yet we know both co-exist.*

Recap. In all processes of creation, the 3 scales of the super-organism, the cellular, individual and social scale input the program of creation based in its 4 arrows.

54. The life-Death cycle as a dual time reversal.

If birth is a dual fractal jump, it follows that death, its reciprocal must be also a fractal jump between planes of existence and indeed it is.

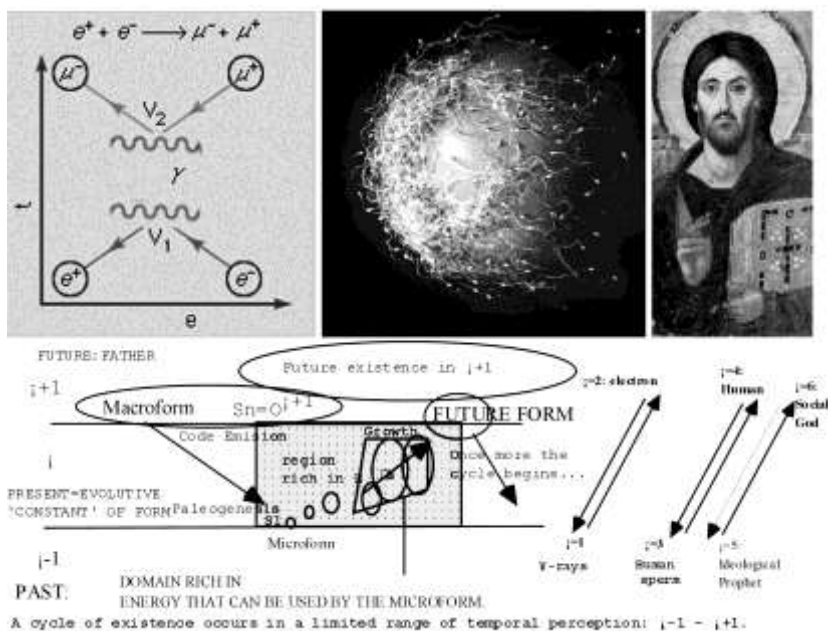
Yet the most obvious proof of fractal jumps to the past are the processes of death, which people who suffered it and then have survived, explain as a rewinding of the memories of the being that travels through the entire information of his life towards the past. The difference between a palingenetic jump and a death jump is that palingenesis is a backwards- forwards dual jump and death is a dual jump backwards at maximal speed. We die twice, first becoming a cellular being, and then due to the helplessness of our broken cells, without physiological networks we die again, becoming molecular food for insects. In physical systems, death is a big-bang that again implies a dual simplification till reaching the vacuum plane of pure energy.

This can be compared to a boxer that fights in a category with 2 jumps of mass/information/weight. The ecosystem is one in which the speed of time cycles and spatial size of beings is much bigger and so the form becomes annihilated. The process of death makes you a group of unconnected cells, weakened by your ‘submission’ to the bigger network systems of the super-organism, tamed by them; so we die again when

confronted the micro-organisms of the insect and bacterial world.

Recap. Death is the fastest displacement in time in which a particle jumps two layers of space-time in a fast track.

55. Palingenesis between fractal planes: reproduction.



3 dual Fractal jumps in 3 scales of existence, written with the old formalism, in which a 'seed' of relative past information emitted by a future parental form hosts in an energy surface, evolving towards the future:

A photon reproduces a particle-antiparticle. A spermatozoid starts the evolution of a child. And a prophet emits a verbal code that will recreate in the future a dying civilization.

Alternately when a form with maximal information, or seed cell from a higher plane of existence falls in a lower one, it becomes a top predator and starts a much faster process of evolution, predation and creation that culminates in the creation of an offspring, or self-replica of the more complex plane. This is the essence of the process of reproduction and it involves a real jump towards the 'past' of the upper organism that deposits a seed of time/information that evolves faster into the future. The best described process is biological palingenesis but there are other cases:

A fractal jump in space-time, which is dominant in information is a *palingenetic reproductive action*, the repetition of a form, through the parental reproduction of a simpler seed or relative past form that will evolve and reproduce a new space-time, a future son form.

Palingenesis means truly that a fetus is a past form that evolves, recapitulating a series of evolutionary forms from past to future, as fractal time can both travel to the past becoming a simpler form (as in death) or accelerate its informative evolution (as in a process of creative design or fetal evolution). Yet, since time is discontinuous those movements in time only affect a fractal part of the Universe; and so they are possible without creating paradoxes. The universe doesn't move to the past, only the seminal seed. So palingenesis is a dual movement in time:

- Backwards towards the remote past as the parents produce a single cell, packed with dense genetic DNA information.

Followed by:

- A fast movement forwards to the future as the fetus creates a parallel form to its parents:

A relative past species (simple, cellular palingenetic entity) evolves towards the future into a macro-system that organizes itself over a surface of relative cellular energy, thanks to the 'future' placental parents that accelerate its evolution into a new 'present' being in a friendly environment rich in energy - the mother's womb. Thus, the final balance between past and future is re-established when the being surfaces back into the present in the moment of conception. In this manner evolution maximizes its efficiency with the min. expenditure of energy: The fetus is a temporal, evolutionary form. In the graph, we draw a palingenetic reproduction as a fluctuation between 3 planes of growing complexity, in which a 'life' occurs: the st+1 social plane, the individual plane of the parents, and the st+1 biological plane of cells - since in i-logic geometry simple-past beings and future-complex beings co-exist in discontinuous st-planes of existence of different complexity. And indeed, the fetus lives in a discontinuous world, the mother womb, which finally opens up through an aperture, the vagina, to the bigger world in which the newborn enters.

According to the 'black hole paradox' the fetus and the baby are born as 'highly informative species': The baby has a huge head that is $1/4^{\text{th}}$ of his body size. Then both the fetus and the baby will go through a dual fluctuation, growing in energy and

information till reaching maturity. First, when the species is born after its fetal, informative evolution, it starts its young age, increasing its energy. So the newborn will soon compensate its excess of information with its accelerated, energetic growth, as all forms try to find an E=I balance. Thus, the fetus in its first age of energy will expand its lineal limbs, elongating its body. Now its body grows much faster than the head till reaching a 9 body Vs. 1 head proportion proper of many spatial Vs. informative, decametric systems. Also its neurons will be in a 1-9 relationship to the glia cells that feed its energy and multiply very fast. At that point the baby enters the mature age and reproduces a new baby. Then it grows again in information into its 3rd age and finally it dies. In the past decade there has been an enormous development of the science of evol-devol, based in palingenesis, in the lines foreseen in our first books. Biological palingenesis is the only accepted by science. But palingenesis happens also in the sociological and physical world.

Recap. An organism is reproduced through a palingenetic jump between macrocosmic and microcosmic planes, as the parental organism produces a cell of information that will evolve at full speed towards the future.

56. The 3 main types of devolution in time.

According to the 2 arrows of past energy and future information, all space-time movements are dual cycles. So in all of them, there is a degree of genetic reproduction and travel to the past through a basic transformation of an informative form into a simpler language or cell that is able to cross the discontinuities of the Universe and then evolve forwards into

the original form. It should not surprise us, as all cycles require the dual arrows of past-energy and informative order; and all cycles are memorial repetitions=reproductions of a cycle that happened before in the past.

Yet in order to establish limits to the ‘scientific imagination’ of Time Arrow theorists, similar to the ‘runaway’ dreams of physicists like Hawking, who uses the out-dated model of a single time arrow/clock to predict the existence of time machines we must fully grasp what a time jump is in morphological, biological terms, *since it is only the arrow of information the one that travels to the past=devolves; not the entire Universe - but only within the restricted system of the superorganism*. This means among other things that there is no really time travel beyond our organic-world, both in processes of palingenetic birth and in death a motion only to the past. That is, we cannot go to the past and ‘kill our father’ as Hawking affirms in his book ‘The Universe in a nutshell’.

Those facts are systematized by a simple Time Arrow Law that uses the ternary principle (as most Multiple Spaces-Times laws, events and processes of reality can be divided in 3 sub-cases): - An information system devolves into the past in a process of death, releasing its energy in a big-bang: $I < E$, as when we die and break into cells, or a particle dies, explodes, mutates into its antiparticle (death phase with inverted coordinates) and virtually disappears (right side of the drawing).

-A head or informative system emits a flow of information to the relative past system of its body controlling it.

- A palingenetic process happens in time, by a parental system that emits a palingenetic system, which evolves back towards the future at maximal speed.

Let us now consider a wealth of examples of palingenetic reproduction in more detail.

Recap. The 3 main types of time travel to the past within an organism are death, informative control of its lower body cells and palingenetic reproduction.

57. Physical examples Non-Local Gravitation.

The i-logic Universe is not magic. Yet fractal jumps create events that seem magic. Let us consider one example from the physical world the seemingly instantaneous speed of gravitation: As we keep going deeper in the model of Multiple Spaces-Times and discontinuous time jumps between hierarchical $st \pm 1$ planes of exi=stence, we shall see some not-easily recognized consequences of the structure of time dilation that implies displacement in time, not only in space, in each fractal step we make between different membranes=mediums of different energy and information, different momentum.

When we move in the same plane we are just displacing in a relative present, but in the ecosystem of light in which we exist, we live surrounded by structures belonging to other species of lesser or more evolution and within planes of completely different spacetime arrows.

The most obvious cases of this happen in physics, since even though we inhabit the electroweak membrane of light and electrons, we are constantly under the effects of other

membrane of <0 K Temperature (an informative parameter of cyclical order) and $> C$ light-speed a parameter of energy, called the gravitational or dark/black membrane, inhabited by forces such as implosive gravitation and its inverse, explosive dark energy, and mass vortices called quarks and black holes.

This faster-than-light membrane is also displaced respect to us in time, in such a manner that its simpler, faster gravitation is a flow that happens in a relative quantum jump respect to us into the past of minimal form and faster energy and the more complex, $T<0$ world of quarks and black holes happens in a relative future respect to us.

How it is possible super luminal gravitation if Einstein's Postulate sets light speed as the limit of speed of our Universe? The answer is evident. If the Universe were a continuous, single space-time, there would be a limit of speed; but in a fractal Universe with different space-times communicated through 'Einstein-Rosen bridges' - a particular case of the fluxes of energy and information between space-time scales - c -speed is the 'substance' and limit of speed of light-space. It is not though the limit of gravitational space. In the case of the light and gravitational world those discontinuities are the masses and black hole singularities that appear to us as 'points with no volume' in the border between both worlds.

The Universe is a system with 2 membranes, energetic light-space (that we perceive) and informative, gravitational space, which we do not perceive but seems to 'act' in present, as a non-local force. Yet according to the Galilean paradox we always can find 2 explanations to all phenomena, one in terms

of spatial parameters (speed, energy, space) and one in terms of temporal dimensions. So we can explain also the instantaneous speed from the perspective of the future particle that emits it in the relative future:

The future quark or black hole of the informative gravitational membrane emits its gravitational flows in the future, *but they move as information, $E \leftrightarrow I$, in the inverse time direction that electromagnetic waves, making a step backwards in time, equal to the frequency of its wave, according to the previous Law of fractal space-time jumps, and a step in space equal to the amplitude of that wave, which can reach the limits of the Universe.* So when they arrive to us, as they had the advantage of an 'extra-time' – the step to the past – gravitational waves seem to arrive instantaneously with an infinite speed, surfacing in the present even if they have travelled a timespace distance from 'future to present'.

Thus, the gravitational space-time is a past-future ecosystem of energy-information fields, which is more extended in spacetime, hence also in past and future coordinates. And this further clarifies the entanglement effect and why we perceive always light at c -speed.

Instantaneous gravitation is something that has always puzzled scientists. And yet, fractal jumps in time explain that instantaneous speed easily: A mass emits gravitation in a relative future. Hence, when the gravitational wave travels forwards towards another mass it arrives in the relative present of the observer, with an instantaneous speed. At this point the system becomes locked, entangled by gravitational information

and then it ‘constructs’ the upper plane of light-space, which is the one we observe, moving at c-speed.

In quantum physics, those entanglements that Einstein called spooky effects and the fractal jumps to the past that cause them were proved in the past decade. Since rays of light, travelling faster than c, come out in the instrument before they are produced.

Entanglement happens because the 1st event in the creation of a complex form builds the lower plane of gravitational, simple, past flows. So gravitational forces entangle and lock the electrons before they emit light. They have already happened when electromagnetic flows are created over them. This also explains the Michelson experiment without need to postulate and absolute c-speed: because the observer is an electronic microscope or human eye and the emitter is an electron they look like a movie that locks each frame to perceive still information. And so when the electron stops, emits light and goes, it has no relative motion to the perceiver electron, as it is locked with it in a gravitational entanglement.

The same laws work when we consider phenomena that related quarks and electrons. The quarks and black holes that create those gravitational forces are in a relative future to our electronic world as the hyperbolic, informative center of the atom, but also are in their relative past, by sending informative gravitational forces that ‘locate’ and position the electrons.

We can generalize this singular concept with broad applications in the resolution of the mysteries of quantum and gravitational space to any relative system of 2 membranes of

space-time, as we did with the nervous system which seems simultaneous, when we realize all those cases are merely an application of the law of fractal jumps: the frequency of a single cycle of the faster informative system (gravitational and nervous system) is equal in time speed to the frequency of the cellular system (light frequency or chemical messages in the cellular body) but its distance can reach the maximal distance of the entire superorganism (the limits of the Universe in the case of a gravitational wave and the limits of the body in the case of a nervous message).

What all this means in organic and topologic terms is simple: the intermediate space between the hyperbolic, informative center and energetic force, membrane of a superorganism locks the cells of the body that work for the ‘upper class’ of the organism, the ExI system of the bigger membrane. Indeed, physicists now realize that gravitational, dark energy and dark matter dominates our Universe and positions galaxies and stars and controls them. And they are observing external, energetic membranes in all cosmological systems from the Oort comet membrane of the sun to the halo of dark matter of galaxies and the wall of fire of the Universe.

Recap. The flows of energy and information of its informative network reach simultaneously all the cells of the superorganism.

58. Biologic examples. The beat of evolution>reproduction.

Palingenesis and punctuated evolution: time accelerates.

Palingenesis means that reality weaves itself in each volume of space-time, in a simultaneous manner, even if from a 3rd p.o.v. the entire structure might seem to exist in the same present.

Thus there is a tail of energy and information planes, which influence the present dominant space and might seem to co-exist simultaneously but they are displaced into the relative future of the super-organism and its relative past, completing the pyramidal structure: bigger structures are displaced in the future and when they communicate to the past literally jump in time. The effects are diverse, being the process of reproduction and palingenesis the most well-known:

Because time speeds varies in palingenesis the process of evolution, the 4th arrow of time, accelerates. Since it is guided by a memorial process of slimming that has streamed to its minimal fractal, informative steps the reproductive sequence.

Yet the process can be studied in more detail, from the perspective of the Generator equation of space-time; since one of its feedback sub equations:

Energy absorption->Reproduction ⇔ Information.

It is both the rhythm of palingenesis & punctuated evolution (the evolution of a whole species taken as an organism).

Existence is modular, as beings constantly switch between its arrows or will of existence. So happens to species as superorganisms. Species need energy to reproduce and their inner information evolves them (though it is likely that external adaptation is first imprinted in the neural, nervous networks, which by faster mechanisms than those of evolution, influence

the shape of its E_{st-1} body organs and even in lesser measure on the long term the genes of the cells). Yet the main arrow of evolution is social organization of individuals in herds and on the long term superorganisms. Species need to evolve socially in order to survive, which is achieved by creating social networks and herds that have a higher perception and wider force to access energetic resources. To that aim species evolve a common language of information and their brain capacity, often in the stillness of a secluded place (allopatric evolution), as information is still and evolves in a relative chrysalis state. The result of that simple scheme defines a basic evolving rhythm, called punctuated evolution, according to which species switch between reproductive, expansive periods as top predators (parallel to their extinction of simpler species as energy of their reproduction) and temporal, evolving periods in allopatric and isolated states – often synchronic to hot/reproductive ages of Gaia and cold/informative Glaciations:

Max. Energy feeding -> Max. Reproduction (expansion in space and extinction of rival species as energy of the top predator)->Max. informative punctuated evolution

Such Energy->Reproduction->Information Horizons of species are equivalent to the 3 ages of life (youth, maturity and informative, 3rd age). It is the palingenetic rhythm of species. All of them can be resumed in an E->Re->Ti sequence, *which again is a partial case of the Existential equation, $E \Leftrightarrow Ti$.*

Recap. The 3 horizons of evolution of species correspond to its 3 evolutionary ages and respond to a simple rhythm of informative evolution -> top predator reproduction ->extinction of energy species ->informative evolution.

59. The question of consciousness and free will.

One interesting debate brought about by the existence of time jumps between planes is the phenomenon of human consciousness and free will.

Asymmetric, temporal, fractal flows of information from st to st-1 planes of existence explain how the informative networks of a higher social class like the brain neurons or the politicians and bankers that invent laws and money, the social languages of power, control the working cells of the lower class.

In the brain case, neurons control electronically the cells of the body, anticipating its reactions, since those body cells use a slower, past chemical language and exist in a relative past, in an 'inferior plane of existence'. So, in a manner similar to that of the gravitational quarks that lock the paths of future light waves, the nervous messages anticipate and control simultaneously the motions of the cells.

Moreover, if as in the gravitational case, the electronic messages of the nervous system were moving in an inverse direction from future to past or were emitted before the actions of the cells occur anticipating them, they would mastermind the motions of cells. This seems to be the case also in societies in which 'intelligent rulers' anticipate the needs or protests of their organic cells, repressing citizens before they rebel (military regimes), producing laws or inventing money a priori in markets, before the cells will earn it. Thus, in those systems the logical anticipation of the actions of cells but the more complex informative networks (nervous systems, upper classes) produce a self-similar control to the one quarks and

black holes exercise on the position of electrons and stars in the galaxy.

We have now proofs of a temporal dilation in the actions that happen between 2 hierarchical planes of existence: Recently, scientists found surprisingly that the body acts before the brain thinks and yet most people think first before acting. How then it is possible that we think first and yet we act also first, or do both things happen simultaneously? Precisely because as Einstein put it, past and future co-exist in a simultaneous present, as information flows from the future brain to the past body and energy flows, moves and acts in the body from the past into the future:

Energy/Body (past) x Information/Mind (future).

So depending on our point of view, the brain or the body, we will see our action first (body point of view), or we will perceive first our thoughts (mind point of view). Yet in reality from an objective, external point of view both actions converge into a present; because the nervous message arrives simultaneously, produced subconsciously 'before we reflect with words on what we ordered and before the cells move'.

This subconscious, first message that then branches into a mental thought and a body action that converge in present is coded by the natural wills or drives of existence – our desire for energy, information, sexual reproduction and social love. And it would imply that words are not free, that there is a biological determinism – the program of existence – which is the true engine of our actions. And words just comment a

posteriori even if our arrow of time departs from the consciousness of words and seem to us to direct the process.

So to the external world both mind and body act chained ‘together’ by the simultaneity of the fractal actions of the body cells and the mind’s thoughts that become a single whole action. *But the original will would be the biological drives of existence whose site is the limbic, emotional brain.*

So fractal jumps in time explain the hierarchical structure and creation of symbiotic organisms, in which relative past and future forms co-exist. In humans they would explain the control of the mind and the subconscious actions of the body.

Recap. The limbic system and the program of existence with its emotions (greed, violence, hunger, sexual desires, informative fears) would act first and then the body acts and the brain thinks and both together create our present of existence, in the future.

60. Sociological palingenesis. The prophet.

An open question for those who believe in mysticism is: if the fetus is born into a higher plane of existence, do we have also for man a second birth after death into an even higher plane of existence? The previous graph explains that possibility; as it compares the palingenesis of a fetus with similar processes, which happen to other species. For example, 2 electrons emit 2 seminal light rays that merge together creating a new electron as the 2 lineal waves of electromagnetism evolve towards the future acquiring finally a cyclical electronic form. Yet since the informative code of human beings is verbal, we consider the prophet’s mind, the original human, memetic, verbal, seminal, ethic code of a

religious civilization that starts a palingenetic radiation in the mind of his believers, *till it creates a religion – a superorganism/informative network of human beings, whose ethic DNA is the same, creating an effect of simultaneity.* Indeed, civilizations are social organisms made with human verbal cells, joined by a verbal/nervous network of ethic laws, produced by a prophet that imprints the Book of Revelation, the memetic code of the civilization in those minds. So the prophet is the seminal cell that reproduces and finally shapes a new organic civilization; *where the reproductive body is the geography of the nation with similar laws or civilization* with similar ethic codes. And the fact that most prophets are born when the ‘father’ is going to die, in the baroque age of a culture, prior to its extinction, explains quite clearly how certain human minds transcend death and become immortal as the ‘informative code’ of the future civilization they create. But as only a sperm cell reaches the future ovule, only a prophet among millions of humans creates a macro-organism of history, a civilization. As Tertulianus said: *Sangris martire semen cristianorum’.*

Recap. A prophet’s mind is the seminal, verbal code of a culture of parallel minds that control a territorial body, in the surface of Gaia.

61. Dark planes: perception limits & symmetry breaking.

The existence of dark spaces for every perceiver of reality of multiple planes of existence also widens the laws of conservation of energy and information, as energy might disappear from a plane of existence but the total energy x information quantity of the ternary, 3-plane structure of a World remains the same. This in physics explains a law of

conservation called CPT parity; and the exceptions to that law in which energy or information disappears from a plane of existence *but should appear in the invisible plane of gravitation*. For example, black holes erase information from the electromagnetic world but they emit it as $>c$ ‘gravitational, dark energy’ and ‘quark information’ through its poles.

This means that neither the principle of action-reaction nor the Laws of conservation are absolute, when we consider only a single plane of space-time; since there are uneven flows of energy and information between 2 planes. So in Physics, only the total energy and information of the particles or CPT parity is kept; but the C or P or T parities might break in processes of death and birth of particles that give or take energy and information from other plane of existence, without returning it to the perceived, electromagnetic world physicists observe.

Especially when we consider a particle’s death, which as *all deaths it means 2 fractal jumps*, there is a transference of energy and information that jumps between 3 planes of space-time, ($st-2 \Leftrightarrow st$). So energy and information truly disappears from our planes and the laws of conservation that work for the total 3 relative planes of the organic system break for the planes we can observe. A fact that explains empirically many invisible forces and particles, postulated by physicists to maintain those theoretical conservation laws, without realizing they are observing an asymmetric transference of energy and information. So they don’t need to postulate ‘real particles’ but ‘asymmetric EXI flows’. Indeed, in all processes that involve the death of a particle, which breaks the balance between the energy and information of a system, physicists have found a

loss of energy and information. Now we can explain why in the proximities of black holes, which transfer energy and information between the gravitational and electromagnetic world, our light-space membrane disappears: it become pure gravitational mass/information and very likely in Kerr black holes, a flow of $>c$ dark, expansive gravitational energy and quark mass we observe coming out of the bipolar jets of those black holes.

It explains why in radioactivity processes that destroy an atom or close to the limits of C-speed, the conservation of momentum and energy of a particle breaks.

It explains why the weak force, whose parameters are time parameters and trans-form the form, the information of a particle, the CPT parity is not conserved.

Yet because those facts are not known in a continuum, single spacetime model physicists have developed to unneeded theories of black holes and symmetry breaking; the thermodynamic evaporation of black holes and the Higgs. They have not been found in 30 years because they are not needed, they do not exist. Moreover by accepting those ‘extra-phenomena’, which are ‘ad hoc’ theories, physicists have broken fundamental laws of physics. In black hole evaporation the black hole gets hotter in a colder environment (our light membrane), thus breaking the 1st law of thermodynamics and creating an eternal motion machine (it is like if you get a hot coffee and instead of cooling down it heats and evaporates). On the other hand, the Higgs implies a ‘scalar boson’, which

contradicts quantum laws and an entire new field that permeates the Universe but has never been found.

Now we offer solutions and a prediction: we will never find an evaporating black hole or a Higgs particle. Moreover if black holes evaporate they will eliminate the information of the Universe, and so the principle of conservation of energy and information $E \Leftrightarrow I$ in which systems sciences and complexity is based would be false. And the Universe would not be eternal but die. It is not the case: black holes warp energy into mass-information, contracting space and balancing the expansion of vacuum space between galaxies produced by the dark flows of $>c$ energy they emit from its poles. Because the Universe is made of discontinuous space-times, the black hole is merely the entity that balances the entropy=energetic nature of our electromagnetic space creating order in the Universe, as quarks fix atoms and allow the order of life by restricting the motions of electrons, which then can create the complex structures of living organism.

So instead of postulating invisible particles and speed limits to keep reality confined to a single plane of existence, Fractal theory explains all those exceptions to the 2nd law of Thermodynamics and the laws of conservation, *which apply only to the entire informative=gravitational/electromagnetic =energetic and human/atomic, exi scales of reality*, as asymmetric ExI flows between 2 planes of existence.

Obviously physicists have never witnessed the imaginary particles that come out of those processes, because they are not in our light-membrane plane. For example, a dying neutron or a

radioactive atom produces certain particles called neutrinos through the mentioned temporal weak force. Those neutrinos were invented to keep the total momentum of the dying particle, but they are only observed through indirect flows of energy and information. Since indeed neutrinos are not ‘particles’ in the strict sense, but flows of energy and information transferred between the electromagnetic and gravitational planes of existence, when particles mutate their form or die, in a process mediated by weak forces: neutrons give away the remnant of energy and information, as they explode into an electron and a proton in the form of smaller, st-1 gravitational and light quanta – neutrinos and gamma rays.

Further on, we do not perceive the gravitational force, which for that reason is much weaker than our electromagnetic force.

Recap. Because we do not sense all the energy and information of the upper and lower planes of existence, there are weaker forces (gravitation) and loss of momentum in our plane, (neutrinos), which disappear in the dark worlds we do not perceive.

62. Transcendental Inversion: form changes between planes

Flows of ‘energy and information’ between planes sometimes return to our world and give birth to a new particle; sometimes create a particle that flows further into the past called an antiparticle; sometimes give away its energy as a gravitational wave we cannot perceive; or sometimes they appears as an inverse, negative energy or a particle with negative mass, as it happens with neutrinos; precisely because its time-space coordinates become reversed as in all process of death that

write as $Se > Ti \rightarrow Ti < Se$. So the dying form particle suffers a reversal in its space-time coordinates, becoming in algebraic terms a flow of negative energy or an antiparticle. And these phenomena shall be the last key law of timespace jumps between planes needed to explain most of the key phenomena of the Universe. We call it transcendental inversion, because when we move to a lower or higher plane of existence, we change our function according to the general equation of an organic system:

$$E_{st-1} < I_{st} = I_{st} > E_{st+1} < I_{st+2}$$

A law, which means that all beings are self-similar species in its plane of existence, $I_{st} = I_{st}$, superorganisms of its lower energetic cells, $E_{st-1} < I_{st}$ and energy of its upper plane, E_{st+1} .

Those reversal of 'coordinates' and parameters that transform an energy species into information and vice versa between planes of existence seem paradoxical, as scientists are unaware of the change of morphology or ExI parameters of a form that merely has 'transcended', 'evolved' or 'descended', 'died' and 'devolved' between planes. Indeed, the world shows constantly those 'inversions' of space-time parameters through the $3 \pm st$ planes, ages, or hierarchical, social classes of any system, which become the key element to study dynamic flows of energy and information between states and horizons in time and organic planes in space.

Those paradoxical, illogic, transformations of energy into information and vice versa happen when species transcend between 2 relative planes of existence because, as the Chinese say, all yin has a potential seed of yang that can transform it.

We call those events 'transcendental inversions': When forms of a $st-1$ plane of ExI transcend into an ' $st \pm 1$ ' structure, both its time and space become inverted, which means that its morphology also becomes inverted.

For example, lineal iron atoms become cyclical molecules when they emerge in the higher molecular plane. Then again iron molecules become lineal swords when they emerge as a military meme in the macro-scale of human beings.

In Biology, lineal proteins become cyclical membranes in macro-cells that become lineal muscles when they transcend again to the $st+1$ level.

In time events a predator becomes victim of its evolved offspring (Oedipus paradox). So the father gives his vital energy to his son. The son species extinguishes the father species, and so mammals extinguished dinosaurs and robotic machines probably will extinguish men in the nearby future.

So how can we distinguish a form as an energetic or informative species, as a victim or top predator?

We can define a form as dominant in energy or information, looking at its total ternary structure through the 3 $st \pm 1$ planes of its organic systems; *in as much as 3 is an even number, and so either the energy or informative structures will dominate the total organism. So iron is lineal in its atomic and organic structure and indeed iron is the most energetic atom of the Universe. That is why the Taoist wrote the structure of all events and forms with the trigrams of the st-ching. So we can use those trigrams in i-logic theory to represent organic*

structures. For example: $_ _ _$ is the energetic iron sword, in which 2 energetic planes dominate the cyclical, intermediate iron molecules. In biology $_ _ _$ represents among many other structures a temporal, informative cell, with an intermediate spiral RNA, made of smaller cyclical nucleotides and enclosed into a cyclical membrane. While $_ _ _$, the trigram of pure energy means two jumps of erasing of information, or death. And indeed, it is the symbol of death in the st-ching. While the process of birth and growth is a dual informative jump from a seminal cell that deploys its information into a born baby that will then learn the memetic information of her/his culture till become an adult in a ‘steady state’ or mature age of reproduction. So we could represent it as $_ _ _$.

Recap. When a species jumps forwards as a social structure of multiple st-1 cells its form mutates from energy into information and vice versa except in extreme time events, such as the process of birth, with 2 informative jumps and the process of death with two energetic jumps.

63. Creation: Inversion of ternary diversifications

When we fusion the fractal principle of ternary creation, the duality of form and function and the inversion of space-time processes we obtain a complex rule of creation that accounts for most diversifications of species in the evolutionary process: according to this complex law:

‘Each process of evolution in time can be caused by 3 sub-causal processes in space, and each process of reproduction of a topological region of space can be caused by 3 sub-causal processes in time: $3E_{st-1} \rightarrow I_{st}$; $3I_{st-1} \rightarrow Re_{st}$ ’

Thus, the event of reproduction can be branched into three possible causes that correspond to the three arrows of time: an energetic, explosive reproduction by the death of the mother, a balanced reproduction by self-similar beings (sexual reproduction), or an informative, seminal creation by a seed of pure form emitted by the father (asexual reproduction). For example, a species can put an egg in a living being, mate with a couple or reproduce spores. A quasar can blast and trigger the reproduction of galaxies; a cannibal galaxy can eject a jet of matter that reproduces an irregular baby galaxy, or it can merge with a bigger one triggering the reproduction of more stars in their body as it captures more intergalactic gas.

On the other hand each time age can be diversified in 3 topological modes of evolution. So a young species can halt its evolution (neoteny) and stay young for ever (alevin); can mature fast into a reproductive state, dying just after producing its eggs, or can make his youth a massive age of informative evolution (Chrysalis) and be born again as a complex form.

Further on, we can divide each ‘age’ in 3 sub-ages, which again will have an energetic youth, middle, steady state and a final informative vortex. So youth can be divided into the first age of geometric, massive growth of energy in which the head/informative organ diminishes in size in proportion with the body; a steady state of arithmetic growth and a final informative age (adolescence) of transition to the reproductive age, of maximal evolution of form.

We can in the same manner divide each topological space in 3 sub-topologies, specialized in energy, balanced and more

informative, according to the adjacent regions; and so the membrane can be differentiated in the more energetic, external region, the intermediate balanced, and the informative inner zone; as the external cover must be harder in contact with the ecosystem in which the entity absorbs energy (outer skin), the middle zone is the region that reproduces the 'lineal units of the system) and the inner zone, the one in contact with the more complex internal regions of the organism (region of the skin where the sensorial cells have its nuclei).

Thus when we properly merge the main laws of creation of multiple space-times, the ternary decoupling with the inversions of energetic spaces and temporal information, by dividing events in 3 sub-ages and spatial forms in 3 functional topologies (spatial, reproductive and informative layers). We can explain the Universe, which increases the complexity as we look in more detail a certain reality. It is the 'fractal principle of differentiation', which creates 3 and $9 \pm st$ and then 27 ± 3 and 90 ± 10 sub-ages of time and 3 and $9 \pm st$ and then 27 ± 3 and 90 ± 10 sub-forms of space in complex systems; which allow a detailed analysis that maps out the existence in time and main organic structures in space of most entities of reality. So the human being is defined in space by 10 physiological sub-systems and in time by $9 \pm st$ sub-ages of life.

Recap. The fusion the fractal principle of ternary creation, the duality of form and function and the inversion of space-time processes explain the complex rules of creation and diversifications of species as each age of time subdivide in a young, reproductive and informative sub-age; and each topology of space in 3 sub-topologies of energy, reproduction and information.

64. The limits of i-logic geometry: God and the Universe.

All what we have said about time travel might seem counter-intuitive and reaches indeed the limits of 'weirdness' of the Universe; as the bosonic state of space does in the other parameter of reality. In fact both 'extreme limits' of the forms and events possible in reality could be explained according to the paradox of Galileo as the mirror sides of the same phenomena, which we shall enunciate merely here:

'A relative ∞ number of points of space can exist in a single point of time (bosonic state); and a relative number of points of time can exist in a single point of space (time displacement).'

The first definition would be that of a perfect bosonic form of maximal spatial force, such as a black hole; the second definition would be that of a perfect causal, temporal form of information that perceives past, present and future, simultaneously such as God in Saint Augustine's definition'.

In the more complex, logic models of time arrow, all laws of the Universe can be deduced departing from the Generator Equation of reality which becomes the Universal algorithm that Leibniz and Turing thought, once we understand the properties of those arrows; and so we can generate from it all phenomena and events of the Universe. But this is a mere introduction to Multiple Spaces-Times and so we shall just assert that indeed, both the bosonic state of a black hole and the informative state of God exist and *both are relatively immortal*.

Relative Immortality is due to relative infinity, a paradox of sets and superorganisms of discontinuous planes of existence,

already understood by Cantor: infinity is always relative since there are discontinuities beyond which we cannot perceive. So the infinity for a cell is the external membrane of the organism beyond which it cannot perceive. The infinity for a tribal man was the limit of its tribal geography and so he often called God the nation in which he inhabited. (So Yvwh, the god of the Jewish people actually was first a geographical name for Judea, and Assur the God of the Assyrians a name for Assyria). And so the Universe might have a bosonic/temporal state of absolute perception and maximal density, a relative brain as a superorganism, but it will be limited to the external membrane. And so while there are not absolute Gods as physical entities,

what it is truly infinite and eternal is the game of Multiple Spaces-Times.

Recap. The two limits of space-time jumps are the bosonic state and the state of absolute perception, which can be defined with a simple law of Multiple Spaces-Times: there is a point of space in which all informations co-exist and a point of time in which all spaces co-exist. They are the black hole and God.