Origin of life, evolution and consciousness in the light of the law of syntropy

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CONTENT

INTRODUCTION

Several scientists believe that without the dual to entropy, life will remain a mystery. The evolutionary paleontologist Teilhard de Chardin wrote:

"*Reduced to its essence the problem of life can be expressed like this: accepting the two principles of conservation of energy and entropy, how can they assimilate without contradiction, a third universal law (which is expressed by biology), that of the organization of energy? ... the situation becomes clear when we consider, at the basis of cosmology, the existence of a sort of anti-*

entropy … In other words, not just one kind of energy, but two different energies; two energies which cannot transform directly one into the other, because they operate at different levels ... The behavior of these two energies is so completely different and their manifestations so completely irreducible that we might believe they belong to two completely independent ways of explaining the world. And yet, as the one and the other, are in the same universe, and evolve at the same time, there must be a secret relationship."[1]

Similarly, Albert Szent-Gyorgyi, Nobel Prize for physiology in 1937 and discoverer of vitamin C, wrote:

[1] Teilhard de Chardin P. 1955, *The Phenomenon of Man*, www.amazon.it/dp/0061632651

"It is impossible to explain the qualities of organization and order of living systems starting from the entropic laws of the macrocosm. This is one of the paradoxes of modern biology: the properties of living systems are opposed to the law of entropy that governs the macrocosm ... One of the main differences between the amoebas and humans is the increase in complexity which presupposes the existence of a mechanism that can counteract the law of entropy. In other words, there must be a force that is able to counteract the universal tendency of matter towards chaos and energy towards heat death. Life continuously shows a decrease in entropy and an increase in its internal complexity and often in the complexity of the environment, in direct

opposition to the law of entropy ... We observe a profound difference between the organic and inorganic systems ... as a man of science I cannot believe that the laws of physics lose their validity as soon as we enter the living systems. The law of entropy does not govern living systems."[2]

In the second half of the 1930s, a group of Italian professors held chairs in the mathematics and physics subsections of the newly created Faculty of Philosophy, Sciences and Letters of the University of São Paulo. Luigi Fantappiè was a member of this group and spent 6 years in São Paulo, from 1934 to 1939. Shortly after his

[2] Szent-Gyorgyi A. 1977, *Drive in Living Matter to Perfect Itself*, Synthesis, 1(1): 14-26.

return to Italy he saw the possibility of interpreting the advanced potentials of the wave equation as a new category of phenomena, totally different from the entropic phenomena which respond to the principle of causality. He named these phenomena *syntropic* and could see them in the living systems. Although Fantappiè was among the foremost mathematicians, the finalistic properties of syntropy were considered outside science. In 1977 Ulisse Di Corpo formulated again this theory starting from the energy-momentum-mass equation of special relativity and in 2010 Antonella Vannini provided the experimental proof.

SYNTROPY

The notion of energy comes from the fact that physical systems possess a quantity that can be turned into a force. Even though it is used and studied Feynman notes that: "*it is important to realize that in physics today we have no knowledge of what energy is.*"[3]

The energy-mass relation $E=mc^2$ that we all associate with Einstein, was first published by Oliver Heaviside in 1892[4], then by Henri Poincaré in

[3] Feynman R. 1964, *The Feynman Lectures on Physics*, vol. 1 chapter 4: http://www.feynmanlectures.caltech.edu/I_04.html

[4] Heavside 0. 1892, *On Operators*, in Physical Mathematics, 52:504–29.

1900[5] and by Olinto De Pretto in 1904[6]. Olinto De Pretto presented it at the *Reale Istituto Veneto di Scienze* (Italy) in an essay with a preface by the astronomer and senator Giovanni Schiaparelli. It seems that this equation reached Einstein through his father Hermann who was responsible for the lighting systems in Verona and who, as director of the "*Privilegiata Impresa Elettrica Einstein*", had frequent contacts with the Fonderia De Pretto that produced the turbines for electricity.

However, the $E=mc^2$ does not consider the momentum, which is

[5] Poincaré H. 1900, Arch. néerland. sci. 2, 5:252-278.

[6] De Pretto O. 1904, Lettere ed Arti, LXIII, II, 439-500, Reale Istituto Veneto di Scienze: www.cartesio-episteme.net/st/mem-depr-vf.htm

also a form of energy, and in 1905 Einstein added the momentum (p), thus obtaining the energy momentum mass equation ($E^2=m^2c^4+p^2c^2$). Since energy is squared (E^2) and in the momentum (p) there is time, a square root is used and there are two solutions for energy: negative time and positive time energy. Positive time energy implies causality, whereas negative time energy implies retrocausality: the future that acts backwards into the past. This was considered impossible and to solve this paradox Einstein removed the momentum, given the fact that it is practically equal to zero compared to the speed of light (c). In this way, he returned to the $E=mc^2$.

In 1924 the spin of the electrons was discovered, an angular momentum, a rotation of the electron on itself at a speed close to that of light. Since this speed cannot be considered equal to zero, in quantum mechanics the energy-momentum-mass equation must be used with its uncomfortable dual time solution. The first equation that combined relativity and quantum mechanics was formulated in 1926 by Oskar Klein and Walter Gordon and has two solutions: advanced and delayed waves. Advanced waves were rejected since they imply retrocausality. The second equation, formulated in 1928 by Paul Dirac, also has two-time solutions: electrons and neg-electrons (now named positron).

However, retrocausality was considered unacceptable and the backward-in-time solution was therefore declared impossible.

Luigi Fantappiè was born in Viterbo (Italy) on the 15th of September 1901 and graduated in pure mathematics at the age of 21 at the Normale di Pisa, the most exclusive Italian University. Full professor at the age of 27, he was well known and appreciated among physicists to the point that in 1950 Oppenheimer invited Fantappiè to become a member of the Institute for Advanced Study in Princeton and work directly with Einstein.[7]

[7] Oppenheimer R. 1950, *Invitation letter sent to Luigi Fantappiè*, http://www.sintropia.it/Oppenheimer.pdf

As a mathematician Fantappiè could not accept that half of the solutions of the fundamental equations had been rejected. While listing the properties of the advanced and delayed waves, Fantappiè discovered that forward in time waves are governed by the law of entropy, whereas backward in time waves are governed by a complementary law that he named syntropy, combining the Greek words *syn* which means converging and *tropos* which means tendency.

Listing the mathematical properties of syntropy Fantappiè discovered: energy concentration, increase in differentiation, complexity, and structures: the mysterious properties of life! And in 1944 he published the

book "*Principi di una Teoria Unitaria del Mondo Fisico e Biologico*"[8] in which he outlines a Unitary Theory of the Physical and Biological World, where the physical world is governed by the law of entropy and causality, whereas the biological world is governed by the law of syntropy and retrocausality.

Since we cannot see the future, the dual energy solution suggests that beside the visible entropic reality, a syntropic invisible reality exists. And, since the first law of thermodynamics states that energy is a unity that cannot be created or destroyed but only transformed, the dual energy solution suggests that entropy and

[8] Fantappiè L. 1944, *Principi di una teoria unitaria del mondo fisico e biologico*. Humanitas Nova, Roma: www.amazon.it/dp/B07RYVS89S

syntropy are complements to the same unity.

Entropy and syntropy, one visible and the other invisible, one diverging and the other converging, constantly interact causing the duality of the manifestations of reality: emitters and absorbers, particles and waves, matter, and antimatter, etc.

It is important to underline the difference between syntropy and negentropy: negentropy does not consider the direction of time and considers time only flowing forward.

Fantappiè failed to provide experimental proof to his theory, since the experimental method requires the manipulation of causes before observing their effects.

However, random event generators (REG) are now available. REG systems allow to perform experiments in which causes are manipulated after their effects: in the future.[9]

In 2010 Antonella Vannini formulated the following working hypothesis:

"*Since life is nourished by syntropy, and syntropy flows backwards in time, the parameters of the autonomic nervous system that supports vital functions must react in advance to future stimuli.*" In other

[9] Shoup R. 2006, *Physics without causality, theory and evidence*, American Institute of Physics (AIP) Conference Proceedings, pdfs.semanticscholar.org/4a43/652086a3bacddd63d5bb9da2d2588aeeee2e.pdf

words: "*Heart rate and skin conductance should react in advance to future stimuli.*"[10]

Several experiments support this hypothesis:

– In 1997 Dean Radin of IONS (Institute of Noetic Sciences), measured heart rate, skin conductance and blood pressure in subjects who were presented with blank images for 5 seconds followed by images that, based on a random event generator, could be neutral or emotional. The results

[10] Vannini A. and Di Corpo U. 2010, *Collapse of the Wave Function? Pre-Stimuli Heart Rate Differences*, Neuroquantology, 8(4): 550-563: www.neuroquantology.com/data-cms/articles/20191024041120pm310.pdf

showed a significant activation of the parameters of the autonomic nervous system before the presentation of emotional images.[11]

– In 2003, Spottiswoode and May, of the Cognitive Science Laboratory, replicated this experiment by performing a series of controls to study possible artifacts and alternative explanations. The results confirmed those already obtained by Radin.[12]

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[11] Radin D.I. 1997, *Unconscious perception of future emotions: An experiment in presentiment*, Journal of Scientific Exploration, 11(2): 163-180: deanradin.com/articles/1997%20presentiment.pdf

[12] Spottiswoode P. and May E. 2003, *Skin Conductance Prestimulus Response: Analyses, Artifacts and a Pilot Study*, Journal of Scientific Exploration, 17(4): 617-41: pdfs.semanticscholar.org/4043/2bc0a6b83f717dca2349b189ebdcbe7b3df9.pdf

- Similar results were obtained by other authors, such as McCarthy, Atkinson and Bradley[13], Schlitz and Radin[14] and May, Paulinyi and Vassy[15], always using the parameters of the autonomic nervous system.
- In 2011 Daryl Bem, psychologist, and professor at the Cornell University, described nine well-established experiments in

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[13] McCarthy R., Atkinson M., and Bradely R.T. 2004, *Electrophysiological Evidence of Intuition: Part 1*, Journal of Alternative and Complementary Medicine; 2004, 10(1): 133-143: https://www.ncbi.nlm.nih.gov/pubmed/15025887

[14] Schiltz M.J. and Radin D.I. 2005, *Gut feelings, intuition, and emotions: An exploratory study*, Journal of Alternative and Complementary Medicine, 11(4):85-91: www.ncbi.nlm.nih.gov/pubmed/15750366

[15] May E.C., Paulinyi T. and Vassy Z. 2005, *Anomalous Anticipatory Skin Conductance Response to Acoustic Stimuli: Experimental Results and Speculation about a Mechanism*, The Journal of Alternative and Complementary Medicine, 11(4):695-702: www.ncbi.nlm.nih.gov/pubmed/16131294

psychology conducted in the retrocausal mode to get the effects before rather than after the stimuli.[16] For example, in a priming experiment, the subject is asked to judge whether the image is positive (pleasant) or negative (unpleasant) by pressing a button as quickly as possible. The reaction time is recorded. Just before the positive or negative image, a *prime* is presented briefly, below the perceptual threshold so that it is not perceivable at a conscious level. It has been observed that subjects

[16] Bem D. 2011, *Feeling the future: Experimental evidence for anomalous retroactive influences on cognition and affect*, Journal of Personality and Social Psychology, 100(3): 407-25, pdfs.semanticscholar.org/79ec/e4f787af713d82924e41d8c17ab130f4b22d.pdf .

tend to respond more quickly when the prime is congruent with the following image, whether it is a positive or a negative image, while the reactions become slower when they are not congruent, for example when the prime is positive while the image is negative. In retro-priming experiments, the prime is shown after, rather than before the subject responds, based on the hypothesis that this "inverse" procedure can retrocausally influence the reaction time. The experiments were conducted on more than a thousand subjects and showed retrocausal effects with statistical significance of $p<1.34x10^{11}$, a

possibility on 134,000,000,000 of being mistaken when affirming the existence of the retrocausal effect.

Antonio Damasio and Antoine Bechara's studying neurological patients affected by decision-making deficits, discovered that feelings associated to the autonomic nervous system play an important role in operating advantageous choices, without having to produce advantageous assessments, and that decision-making deficits are always accompanied by alterations in the ability to feel. Damasio noticed that the absence of feelings leads to the inability to "*feel the future*" and to choose advantageously and suggested

that goal-oriented systems, moved by finalities, are based on feelings. These systems use body signals coming from the autonomic nervous system.[17]

Bechara, a student following a specialization course in Damasio's laboratory, devised a guessing task in order to test Damasio's hypothesis.[18] Subjects were seated in front of a table on which 4 decks of cards were placed, each marked with a different letter: A, B, C and D. Subjects received 2,000 dollars (false, but perfectly resembling true money) and

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[17] Damasio A.R. 1994, *Descarte's Error. Emotion, Reason, and the Human Brain*, Putnam Publishing, https://www.amazon.it/dp/B00AFY2XVK

[18] Bechara A., Damasio H., Tranel D. and Damasio A.R. 2005, *The Iowa Gambling Task and the somatic marker hypothesis: some questions and answers*, Trends in Cog. Sciences, 9:4, web.stanford.edu/~jlmcc/papers/BecharaEtAl05_TiCS.pdf

were told that the aim of the game was to lose the least and try to win as much as possible.

The game consisted in uncovering cards, one at a time, from any of the decks. Each card was associated with a gain or a loss of money. Only when a card was turned it was possible to know how much one had earned or lost. Subjects started testing each of the decks, searching for clues and regularities. Decks A and B gave high gains, but led to higher losses, while decks C and D gave lower gains, but led to a slow increase of money. Players gradually developed the knowledge that decks A and B were more dangerous. Both normal subjects and patients produced skin

conductance reactions each time they received a gain or a loss, after they turned a card. However, in normal subjects, after they had turned a certain number of cards, something different happened. Just before they chose a card from a dangerous deck (A or B) a skin conductance response was observed which increased while the game progressed.

Damasio interpreted this as a learning effect. The subject gradually learns the possible negative outcome of each deck, and before a card is chosen the autonomic nervous system informs through the activation of feelings, which in this case were measured using skin conductance. Patients with decision-making deficit

do not show this anticipatory arousal of skin conductance and choose disastrously.

- *Methodology and results*

Antonella Vannini devised a design that allows to distinguish between Damasio's learning effect and Fantappiè retrocausal effect. A detailed description of the experiments is available in "*Retrocausality: experiments and theory*".[19] In this section a summary will be provided.

[19] Vannini A. and Di Corpo U. 2011, *Retrocausality: experiments and theory*, ISBN: 9781520275956, www.amazon.com/dp/1520275951

Experimental trials were divided into 3 phases:

- *Phase 1*, in which 4 stimuli were displayed one after the other on the computer screen. The subject had to look at these stimuli and during their presentation the heart rate was measured.
- *Phase 2*, in which an image with the 4 stimuli was displayed and the subject had to try to guess the one that the computer would have selected.
- *Phase 3*, in which the computer randomly selected the target stimuli and showed it full screen.

This design allows to study together Fantappiè's retrocausal hypothesis and Damasio's learning hypothesis:

- *Retrocausal effect*. Differences in heart rate (HR) frequencies observed in phase 1, in association with unpredictable random targets selected by the computer in phase 3 can be attributed to a retrocausal effect.
- *Learning effect*. Differences in heart rate (HR) frequencies observed in phase 1, in association with the choice operated by the subject in phase 2, can be interpreted as a learning effect.

Four experiments were conducted: the first was used to assess the retrocausal effect, the second and third experiments to study possible artifacts and alternative explanations, the fourth experiment studied the interaction between the learning and retrocausal effect.

- Experiment n. 1

Designing the first experiments different stimuli were tested: black bars placed horizontally, vertically and diagonally on a white background, and other types of stimuli. Data analyses did not show any significant difference among heart rates

measured in phase 1. The hypothesis was therefore analyzed in more depth and it was found that the theory posits that retrocausality is mediated by emotions/feelings and, therefore, in order to assess differences in heart rates measured in phase 1, stimuli in phase 3 must arise emotions. It was therefore decided to use colors and as soon as the 4 elementary colors: blue, green, red, and yellow, were used strong difference in heart frequencies in phase 1 were observed in concomitance to the target color shown in phase 3.

Trials of the first experiment were as follows.

– *Presentation phase*: colors were shown for 4 seconds each. The first one was blue, the second one green, the third red and the fourth yellow. The subject was asked to look at the colors. For each color 4 measurements of the heart rate were saved: one each second. The presentation of the color was synchronized with the heart rate measurement. When necessary, the synchronization was re-established showing a white image before the presentation of the first color in phase 1. The heart frequency device which was used during the experiments did not require any type of supervision. Subjects were

alone while conducting the experiment.

– *Choice phase*: at the end of the presentation phase an image with 4 color bars was shown (blue, green, red, and yellow) and the subject was asked to guess the target color that the computer would have selected in phase 3, by choosing the color bar using the mouse.
– *Random selection of the target*: as soon as the subject chose the color bar the computer randomly selected the target color and showed it full-screen on the computer.

In the first experiment each subject repeated the trial 60 times. This

allowed to calculate statistical significance values within each subject, which resulted meaningful for practically all the 30 subjects involved in this experiment. But when the analysis was conducted combining the subjects together the retrocausal effect disappeared. This was because the direction of the effect was different among subjects. While in some subjects the heart rate increased when the target color was red, in others it decreased, and opposite effects cancelled each other. It was therefore decided to conduct the analysis using absolute difference values from the baseline, for parametric statistical tests such as ANOVA and Student t, and

thresholds for non-parametric tests such as Chi Square. Working in this way results became statistically significant for the sample, and it was found that non-parametric statistics tend to produce results which are more robust and reliable. This is described in the book "*The methodology of concomitant variations.*"[20]

- *Experiment n. 2*

Antonella Vannini was asked to study if the retrocausal effect emerged only when the sequence of the colors in phase 1 was blue, green, red, and

[20] Di Corpo U. and Vannini A. 2011, *The Methodology of Concomitant Variations*, www.amazon.com/dp/1520326637

yellow or if it was independent from this sequence. Five designs were used with different color sequences and using numbers instead of colors. In all these designs a strong retrocausal effect was observed.

Vannini was asked to provide answers about possible errors caused by intervening variables, non-homogeneous groups, measuring device, statistical data analysis and manipulation of data and she underlined the following facts:

– The experiment is designed in such a way that the only element which differs is the color selected by the computer in phase 3. No other

variables exist which might be associated to the target or non-target condition of the color.

- In this experiment only one group is used. Since the samples is identical for target and non-target stimuli, measurements cannot be affected by sample differences.
- The measurement of heart rate frequencies is performed in the same identical way for targets and non-targets. Consequently, no systematic error of measurement can be associated to targets and non-targets.
- Statistical data analyses were performed using parametric and non-parametric techniques. It

became clear that extreme values could cause artifacts, and this is the reason why non-parametric techniques produced more reliable results.

- *Experiment n. 3*

Another objection which was put forward was that the effect could be a "parapsychological" forward in time effect: the expectation of the subject could interfere with the electronics of the computer determining the random selection of the target stimuli in phase 3.

To control this possibility, the third experiment randomly showed colors

in phase 3. When they were not shown a grey image was used. Only when the target color was shown the differences were statistically significant, when the target color was selected by the computer, but not shown, differences were not statistically significant.

Furthermore, it was noticed that the effect spreads backwards in a continuous way. It is not visible only when in phase 1 the target color is shown, as it was supposed by other researchers, such as Tressoldi in the field of parapsychology.[21]

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[21] Tressoldi P.E., Martinelli M., Massaccesi S. and Sartori L. 2005, *Heart Rate Differences between Targets and Nontargets in Intuitive Tasks*, Human Physiology, 31(6): 646–50, www.patriziotressoldi.it/cmssimpled/uploads/includes/HP05.pdf

Another control which was performed was to generate in parallel random selections of the target colors which were not shown to the subjects. None of these selections correlated with the heart rate differences which were observed in phase 1.

- Experiment n. 4

In order to study the learning effect, the random probabilities associated to the selection of the target color in phase 4 were modified: one color had a 35% chance of being selected (lucky color), one had a 15% chance (unlucky color) and the last two colors had a 25% chance (neutral colors). Subjects were not informed that

colors had a different probability of being selected.

The following hypotheses were formulated:

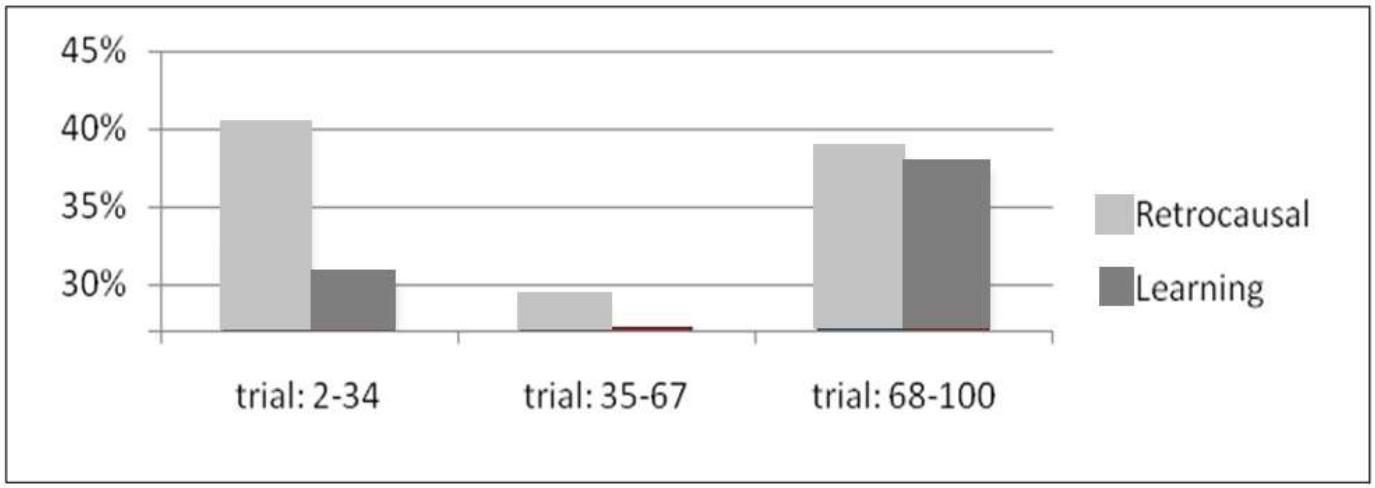
- *Retrocausal hypothesis*: differences in heart rate (HR) measurements in phase 1 in association with target colors (phase 3). These differences were interpreted as retrocausal effects, considering the fact that the selection of target colors happens in phase 3 and heart rates are measured in phase 1.
- *Learning hypothesis*: according to the works of Damasio and Bechara a learning effect develops in the form

of heart rate differences measured in phase 1 in association with the choice (lucky and unlucky) operated by the subject in phase 2; these differences should increase during the experiment.

– *Interaction between retrocausal and learning effect*: the retrocausal effect and the learning effect share the same somatic markers and are therefore both assessed through heart rates. The hypothesis is that at the beginning of the experiment only the retrocausal effect can be detected, then the learning effect starts building up and disturbs the retrocausal effect which decreases. At the end, the retrocausal and

learning effects separate and can be detected. Clues of a possible interaction emerged during the development of the software. Subjects involved in the first 3 experiments reported a “butterfly” feeling in the stomach in association with the choice of target stimuli, whereas subjects involved in testing the design of this last experiment did not report the butterfly feeling and the retrocausal effect showed with less strength. This fact suggested that the learning effect could disturb the retrocausal effect.

Results are summarized in the following chart.



Graphical representation of statistically significant anticipatory responses of the Heart Rate. Results are meaningful above the threshold of 27%.

This chart shows that the retrocausal effect was strong starting from the first 33 trials, while the learning effect was just slightly emerging. Then, in the middle trials the learning and retrocausal effects dropped and in the last 33 trials both effects became strong.

These results suggest that when the learning effect starts emerging it

conflicts with the retrocausal effect, since they both use similar somatic markers. In the last part of the experiment this interference diminishes, and both the effects emerge strongly.

In all the four experiments it was noted that whilst strong effects were observed in the heart rate frequencies, this "intuitive" knowledge translated only marginally into the form of more correct guesses.

ORIGIN OF LIFE

- Biogenesis or abiogenesis?

The first question about life, which has always engaged the imagination of man, is this: *How can life develop from molecules that are not living*? To this question the ancient Greeks responded by saying that life spontaneously generates from inorganic matter because of the action of the goddess Gaia. This hypothesis was reformulated by the Latins as *generatio spontaneous* and in contemporary science as abiogenesis. The major steps in the debate

between biogenesis and abiogenesis are the following:

- In 1668 the Italian physician Francesco Redi (1626-1697) proved that no maggots appeared in meat when flies were prevented from laying eggs, providing in this way the first solid evidence against the hypothesis of the spontaneous generation of life. Redi gradually showed that, at least in the case of all the higher and readily visible organisms, the abiogenetic hypothesis was false.
- Spontaneous generation for small organisms gained favor in 1745 when John Needham (1713-1781)

showed that if a broth was boiled (presumed to kill all life) and then placed in a sterile container it became cloudy, supporting in this way the theory of abiogenesis.

- In 1768 Lazzaro Spallanzani (1729-1799) repeated Needham's experiments, removing air from the sterile container. Spallanzani wanted to avoid contamination by boiling a meat broth in a sealed container. The problem with this approach was that air in the container could shatter the container upon heating. Therefore, he removed the air from the container after sealing it. The broth did not subsequently cloud with

bacterial growth, supporting in this way the theory of biogenesis.

– It was not until the mid-nineteenth century, almost 100 years later, that the great French chemist Louis Pasteur put the debate to rest. By passing air through cotton filters, he first showed that the air is full of microorganisms. Inspection of this material revealed numerous microbes. Pasteur realized that if these bacteria were present in the air, then they would likely land on and contaminate any material exposed to it. The debate brought the French Academy of Sciences to allocate a prize for whoever was able to provide a convincing and

accurate experimental answer to the question. Pasteur entered the contest with experiments similar to those performed by Spallanzani, which used heat to kill the microbes. In a simple, but brilliant modification, the neck of a flask, used in the experiments, was heated to melting point and drawn out into a long S-shaped curve, preventing dust particles and their load of microbes from reaching the contents of the flask. After prolonged incubation the flasks remained free of life, and this ended the debate for most scientists. Results were published in 1862 and explained the errors and artifacts of other competitors.

Pasteur summarized his findings in the Latin phrase: *Omne vivum ex vivo*, indicating that life can only be generated from organic matter, from life. These findings further restricted the abiogenetic hypothesis to special conditions which would have characterized the early stages of our planet Earth.

– In 1924, Alexander Oparin (1894-1980) published in Russian a work entitled *The Origins of Life*[22] in which he describes that the findings on the characteristics of colloids suggest that the ability of colloids to bind substances to the surface indicates a beginning of

[22] Oparin A. 1924, *The Origin of life*, www.uv.es/orilife/textos/The%20Origin%20of%20Life.pdf

metabolism. His book ends with the phrase: "*Work is already in a very advanced stage, and soon the last barriers between organic and inorganic will fall under the attack of a patient work and powerful scientific theories.*" The English version of Oparin's book was published in 1938 and had a wide impact on researchers and public opinion.

– In 1952 Harold Urey (1893-1981) coined the term cosmochemistry, or chemical cosmology, to indicate the origin and development of the substances of the universe. The focus are the elements and their isotopes, primarily (but not always) within the solar system. Closely

related fields are astrochemistry, a branch of astronomy concerned with measuring chemical elements in other parts of our galaxy and in other galaxies. Cosmochemistry focused on the study of the chemical elements on Earth and planets during their evolution. In 1952, in the book *The Planets: Their Origin and Development*[23], Urey assumed that the composition of primordial Earth was like that of the cosmos: 90% hydrogen atoms, 9% of helium atoms, 1% atoms of other elements. From this assumption he deduced that the composition of the primordial

[23] Urey H. 1952, *The Planets: Their Origin and Development*. Yale Univ. Press.

atmosphere should be made of methane (CH_4), ammonia (NH_3), nitrogen (N_2), water (H_2O) and hydrogen (H_2).

– In 1953 a student of Urey, Stanley Miller (1930-2007), published the article *A Production of Amino Acids Under Possible Primitive Earth Conditions*[24]. Miller demonstrated that, in a primordial atmosphere and in the presence of water, the action of electrical discharges (simulating the action of lightning) could generate amino acids, that is the fundamental building blocks of proteins. In his experiments, which used sterile equipment, Miller

[24] Miller S.L. 1953, *A Production of Amino Acids Under Possible Primitive Earth Conditions*, Science, May 15.

inserted gases such as methane (CH_4), ammonia (NH_3) and water (H_2O). The system consisted of liquid water, gas and two electrodes. The experiment was divided into cycles in which the water was heated to induce the formation of water vapor, the electrodes were used to produce electrical shocks like lightning and the whole was then cooled to allow water to condense. Then a new cycle began. After about a week of uninterrupted cycles, where the conditions were kept constant, Miller noted that about 15% of the carbon had formed organic compounds, including some amino acids. The idea was that this

synthesis of amino acids would provide the building blocks for proteins. Miller's experiments produced an aqueous mixture containing various products which were then isolated using a process of extraction. These products contained amino acids, including some of those found in living systems. This aqueous mixture was called "*primordial soup*". Miller gave a decisive impetus to the experimental research of the abiotic origins of life.

- *How did molecules, that are essential for life, form from amino acids*?

Amino acids are the building blocks of life but are not considered to be living forms. Miller's experiments gave rise to a host of other experiments, which are still being conducted to demonstrate the feasibility of constructing complex organic molecules from amino acids. These experiments are aimed at attempting to describe how proteins can form spontaneously starting from amino acids. Results have been very problematic.

Proteins involved in the metabolism of cells are composed of chains which include more than 90 amino acids.

Simple combinatory calculations show that more than 10^{600} (one followed by 600 zeros) permutations are required combining amino acids by chance, to arrive at the "spontaneous" formation of just one protein[25]. This number is greater than all the spontaneous combinations which are possible in the entire history of the universe, since the Big Bang.

In a work published in the American Scientist, Walter Elsasser[26] shows that in the 13-15 billion years of our Universe no more than 10^{106} events took place (also considering the level of nanoseconds). Consequently, any

[25] Fantappiè L. 1993, *Conferenze Scelte*, Di Renzo, Roma.

[26] Elsasser W.M. 1969, *A causal phenomena in physics and biology: A case for reconstruction.* American Scientist, 57: 502-16.

event requiring a combinatorial value greater than 10^{106} is simply impossible in our Universe.

The number 10^{600} is by far greater than all the possible combinations in the history of our Universe. In other words, the possibility that only one protein is formed by chance is null. Elsasser concludes that:

> "*The notion of chance in biology has no logical foundation ... its use to explain life is at best metaphorical, but there is a danger that this metaphor may divert attention in the wrong direction.*"

In other words, the possibility of spontaneous formation of just one protein is nil.

In addition, primordial soups are made up mostly of water, but water leads to the decomposition of macromolecules and makes it impossible for amino acids to chain together in the initial stages of protein formation. In 2004, Luke Leman and collaborators at the Scripps Research Institute and Leslie Orgel of the Salk Institute for Biological Studies[27], obtained peptides (short chains of amino acids) using solutions of amino acids, carbonyl sulfide (COS, a volcanic gas) and catalysts based on metal sulfides. But using this process it is not clear where the amino acids came from, since they require a totally

[27] Leman L. (2004), Orgel L and Ghadiri MR, *Carbonyl Sulfide-Mediated Prebiotic Formation of Peptides*, Science 8 October 2004: 306 (5694), 283-286, DOI: 10.1126/science.1102722

different environment which is not based on water.

Another proposal is that amino acids, which form in water, are concentrated in lagoons which periodically become dry and condense under the influence of dry heat which also creates chemical bonds responsible for the union of amino acids (peptide bond).

The processes of synthesis have allowed to produce 13 of the 20 amino acids involved in the construction of proteins. In addition to these, thousands of other amino acids are generated, which are not present in living organisms.

If it were possible to select and combine only the amino acids present

in living systems (the probability is equal to zero), the resulting combinations would be three-dimensional and not linear, such as that which is present in life's protein chains. The three-dimensional combinations (known as proteinoids) are inappropriate to the metabolism of cells because they cannot be encoded by a linear genetic code. Proteinoids are therefore given no value in the formation and development of life.

Life, as we know it, depends totally on levorotatory amino acids whereas the synthesis of amino acids leads to the formation of an equal number of dextrorotatory and levorotatory chains. The production of proteins in

laboratories is therefore unsuitable for the formation of living organisms.

The synthetic processes for the construction of protein chains leads to the formation of monofunctional molecules that block the ends of the chains, making them inaccessible for further extensions. The presence of monofunctional molecules is therefore a crucial impediment to the development of longer chains, i.e. proteins.

In all experimental approaches, in addition to the desired amino acid, many other substances, which prevent the next steps, are formed.

- *What differentiates the organic from the inorganic*?

Miller's experiments constitute an important first step towards the synthesis of the molecules which are necessary for life but have also led to an impasse. The synthetic production of proteins requires complex procedures of isolation and purification that do not occur spontaneously in nature and are based on assumptions, models and projects which derive from the study of living systems. These models involve theoretical assumptions, about the relationship between inanimate matter and life, which are defined by the various and fundamental

characteristics of organisms discovered thanks to observation, such as the intake of substances and energy from the environment, metabolism, reproduction, growth, mobility, reaction to stimuli, processing of information.

All these features allow to describe different aspects of life. For example, the description of molecular structures allows the understanding of the physical characteristics of organisms and biochemical processes, but this identifies only some individual aspects of the manifestations of life. The same happens with the definition used in exobiology, according to which life

would be a chemical system capable of evolution and reproduction.

The development of models which describe the transition between inanimate matter and life is a consequence of the definition of life which is given in theoretical models. The vast and fascinating knowledge developed studying the details and the reciprocal interactions of molecules and macromolecules, involved in the creation of living organisms (proteins, DNA), has not yet solved the mystery of "life".

We know about life only in relation to material components, but we also know that the DNA macromolecules, for example, can perform their functions only within the highly

structured complexity of a cell. This indispensable whole is a prerequisite for life, and this requires an approach that considers complexity, since the individual and isolated feature alone would have no chance of success.

- Syntropy and the origin of life

The energy-momentum-mass equation implies three types of time:

– *Causal time:* when systems diverge, as it is the case of our expanding universe, the positive time solution prevails, entropy dominates, causes always precede their effects and time

flows forward, from the past to the future. Since entropy rules, retrocausal effects are not possible, such as light waves that propagate backwards in time or radio signals that are received before being transmitted.

– *Retrocausal time:* when systems converge, as it is the case with black holes, the negative time solution prevails, retrocausality dominates, effects always precede causes and time flows backwards, from the future to the past. In these systems no forward effects are possible and therefore no light is emitted from black holes.

– *Supercausal time*: when diverging and

converging forces are balanced, such as in atoms and quantum mechanics, causality and retrocausality coexist and time is unitary.

These types of time recall the ancient Greek division into: Kronos, Kairos and Aion.

– *Kronos* describes the sequential causal time, which is familiar to us, made of absolute moments that flow from the past to the future.
– *Kairos* describes the retrocausal time. According to Pythagoras, kairos is at the basis of intuitions, of the ability to feel the future and to choose the

most advantageous options.

– *Aion* describes the supercausal time, in which past, present and future coexist. The time of quantum mechanics, of the subatomic world.

This classification suggests that syntropy and entropy coexist at the quantum level, ie in the Aion, and that life originates at this level.

A question arises: *How does syntropy flow from the quantum level of matter to the macroscopic level of our physical reality, transforming inorganic matter into organic matter?*

In 1925 Wolfgang Pauli discovered the hydrogen bond. In water molecules, hydrogen atoms are in an intermediate position between the subatomic (quantum) and molecular (macrocosm) levels and provide a bridge that allows syntropy (cohesive forces) to flow from the micro to the macro. Hydrogen bonds increase cohesive forces (syntropy) and make water different from all other liquids. Because of these cohesive forces ten times stronger than the van der Waals forces that hold other liquids together, water shows abnormal properties. For example, when it solidifies it expands and floats; on the contrary, other liquids become denser, heavier and sink. The

uniqueness of water stems from the cohesive properties of syntropy that allow the construction of networks and structures on a large scale.[28]

Hydrogen bonds let syntropy flow from the subatomic level to the macrocosm level, making water essential for life. Ultimately, water is the lifeblood, the essential element for the manifestation of any biological structure.

Water is not the only molecule with hydrogen bonds. Also, ammonia and hydrofluoric acid form hydrogen bonds and these molecules show anomalous properties like water. However, water produces a higher

[28] Ball P. 1999, H2O. *A biography of water*, www.amazon.it/dp/0753810921

number of hydrogen bonds, and this determines the high cohesive properties of water that bind the molecules into large and dynamic labyrinths.

Other molecules forming hydrogen bonds fail to construct complex networks and structures in space. Hydrogen bonds impose extremely unusual structural constraints for a liquid. An example of these constraints is provided by snow crystals. However, when water freezes, the mechanism of the hydrogen bond stops and the flow of syntropy from the micro to the macro also stops, bringing life to death.

Hydrogen bonds make water essential for life, providing syntropy

to living systems. Water draws syntropy from the quantum level. Consequently, it is indispensable for the origin and evolution of any biological structure.

Based on these considerations, in February 2011 we wrote an article for the Journal of Cosmology commenting on an article by dr. Richard Hoover[29] of NASA Marshall Space Flight Center. Dr. Hoover had discovered microfossils, similar to cyanobacteria, in internal sections of comet meteorites and, using electron microscopy and a series of other measures, concluded that they

[29] HOOVER R. 2001, *Fossils of Cyanobacteria in CI1 Carbonaceous Meteorites*, Journal of Cosmology, journalofcosmology.com/Life100.html

originated from these meteors, ie comets.

According to syntropy, life is a general law of the universe which requires the presence of water to manifest. A characteristic of comets is that they are rich in ice which, in the proximity of the Sun, melts and becomes water; therefore, in our article[30] we suggested that, according to syntropy, living organisms can originate in extreme conditions, such as those of comets, and that the discovery of Dr. Hoover of cyanobacteria microfossils in meteorites is consistent with the

[30] VANNINI A. and DI CORPO U. 2011, *Extraterrestrial Life, Syntropy and Water, Journal of Cosmology*, journalofcosmology.com/Life101.html#18

theory of syntropy.

In other words, syntropy considers life a law of the universe that manifests at our physical level thanks to water.

- Attractors

The energy-momentum-mass equation suggests that the present can be described as the meeting point of causes that act from the past (causality) and attractors that act from the future (retrocausality).

Causality requires a big cause in order to obtain a big effect. This is due to the fact that causality diverges

and tends to dissipate. On the contrary with attractors the effect is amplified. The smaller the cause, the more it can be amplified and the greater the effect.

This property of attractors was discovered in 1963 by the meteorologist Edward Lorenz.[31] Lorenz discovered the existence of chaotic systems which react, in each point in their evolution, to small variations. Studying meteorological phenomena, Lorenz found that a small perturbation can generate a chaotic state which amplifies, making weather forecasting impossible. Analyzing these unforeseeable events,

[31] Lorenz E 1963. *Deterministic Nonperiodic Flow*. Journal of the Atmospheric Sciences 20: 130-140.

Lorenz discovered attractors which cause microscopic perturbations to be amplified.

Lorenz described this situation with the words: "*The flap of a butterfly in the Amazon can cause a hurricane in the United States*".

However, for the amplification of the effect, it is necessary that the small flap (the active principle) is in line with the attractor. Otherwise, entropy prevails, and the small perturbation of the flap is lost. On the contrary when the flap is in line with the attractor it is amplified.

This happens in meteorology, which deals with water. The hydrogen bond which makes water molecules special, operates in both directions: from the

micro to the macro, amplifying the effect, and from the macro to the micro informing the attractor. This is well described by homeopathic remedies.

Homeopathy was discovered in 1796 by the German doctor Samuel Hahnemann (1755-1843). This system is based on the so-called law of similes, according to which the remedies must use substances that cause similar symptoms in healthy individuals. These substances are then diluted in water. The strange fact is that the higher the dilution the more powerful is the effect. The most powerful remedies are those in which the substances have been diluted to the point that it is impossible for a

single molecule to still be in the remedy. For conventional medicine, after removing the active ingredient through dilution, effects can only be placebo effects, not attributable to the remedy since no solid molecule of the active ingredient is present.

Homeopathy is undergoing ferocious attacks. Conventional medicine considers homeopathy a scam since the "active substance" (the solid substance) has been completely removed from water by dilution. It is considered impossible that an inert substance like water can be the cause of the effects.

Syntropy claims that the active ingredient, when placed in water, creates links with the attractor. So, by

removing the active ingredient through dilution, the retrocausal bonds remain and are no longer limited to the substance but are free to act on any other structure.

Syntropy explains the effects of homeopathy because of the retrocausal properties of water.[32] Remedies would act backward in time and the effects would be the result of the interaction between causality and retrocausality.

Life shows an incredible complexity that converges towards common projects, despite individual differences. Considering only the

[32] PAOLELLA M. 2014, *Homeopathic Medicine and Syntropy*, Syntropy Journal 1:1-29: www.sintropia.it/journal/english/2014-eng-2-01.pdf

contribution of the past, it is impossible to explain why individuals converge towards common projects and it is impossible to explain the stability of these projects over time.

Attractors explain this stability and this convergence. Attractors behave like relays. When an individual solves a task and receives a benefit, the information is relayed to all the other individuals. Attractors establish an invisible bridge among individuals that allows to develop a shared knowledge. Individuals converging towards the same attractor can build a shared knowledge, without the involvement of any physical means. This is known in quantum mechanics as entanglement and non-locality.

Attractors receive information from individuals, select what is advantageous and redistribute it. This process transforms individual experiences into intelligent information, and provides solutions, projects, and form.

People often ask if attractors imply that the future is already determined. The answer is simply *NO*. They imply exactly the opposite! Attractors indicate that we will inevitably return to where syntropy originates, what Teilhard de Chardin named the *Omega point*, and that the path depends on our choices. If attractors did not exist, we would live in a mechanical universe totally determined by the past. Instead, we are constantly forced

to choose.

Attractors in-form our body and guide it to specific shapes and structures. The hypothesis that with life a different type of causality is at play, had been postulated by Hans Driesch (1867-1941), a pioneer in experimental research in embryology.

Driesch suggested the existence of final causes, which act in a top-down way (from global to analytical, from the future to the past) and not in a bottom-up way, as it happens with classical causality.

Final causes lead living matter to develop and evolve, and coincide with the purpose of nature, the biological potential.

Final causes were named by Driesch *entelechy*.[33] Entelechy is a Greek word whose derivation (en-telos) means something that contains its own end or purpose, and that evolves towards this end. So, if the path of normal development is interrupted, the system can achieve the same end in another way.

Driesch believed that the development and behavior of living systems are governed by a hierarchy of entelechies, which all result in an ultimate entelechy.

The experimental demonstration of this phenomenon was provided by Driesch using sea urchin embryos.

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[33] Driesch H. 1908, *The Science and Philosophy of the Organism*, www.gutenberg.org/ebooks/44388

Dividing cells of the embryo of sea urchins after the first cell-division, he expected each cell to develop into the corresponding half of the animal for which it had been designed or preprogramed, but instead he found that each developed into a complete sea urchin. This also happened at the four-cell stage: entire larvae ensued from each of the four cells, albeit smaller than usual. It is possible to remove large pieces from eggs, shuffle the blastomeres and interfere in many ways without affecting the resulting embryo. It appears that any single monad in the original egg cell can form any part of the completed embryo. Conversely, when merging two young embryos, a single sea

urchin results and not two sea urchins.

These results show that sea urchins develop towards a single morphological end. When we act on an embryo the surviving cells continue to respond to the final cause that leads to the formation of structures. Although smaller, the structure which is reached is like that which would have been obtained by the original embryo.

It follows that the final form is not caused by the past or by a program, a project or a design which act from the past, since any change we introduce in the past leads to the same structure. Even when a part of the system is removed or the normal development

is disturbed, the final form is reached, and it is always the same.

Another example is that of the regeneration of tissues. Driesch studied the process by which organisms can replace or repair damaged structures. Plants have an amazing range of regenerative capabilities, and the same happens with animals. For example, if a flatworm is cut into pieces, each piece regenerates a complete worm. Many vertebrates have extraordinary capabilities of regeneration. If the lens of the eye of a newt is surgically removed, a new lens is regenerated from the edge of the iris, whereas in the normal development of the embryo the lens is formed in a very

different way, starting from the skin.

Driesch used the concept of entelechy to account for the properties of integrity and directionality in the development and regeneration of bodies and living systems.

Independently in 1926 the Russian scientist Alexander Gurwitsch[34] and the Austrian biologist Paul Alfred Weiss[35] suggested the existence of a new causal factor, different from classical causality, which was named morphogenetic field. Apart from the claim that morphogenetic fields play an important role in the control of morphogenesis (the development of

[34] Gurwitsch A.G. 1944, *The Theory of Biological Field*, Moscow: Soviet Science.

[35] Weiss P.A. 1939, *Principles of Development*, Henry Holt and Co.

the shape of the body), neither author showed how causality works in these fields.

The term "field" is currently fashionable: gravitational field, electromagnetic field, individual field of particles and morphogenetic field. However, the word field is used to indicate something that is observed, but not yet understood in terms of classical causality; events that require a new type of explanation based on a new kind of causality.

The entropy/syntropy hypothesis replaces the terms entelechies and fields with the term attractor. An attractor is a cause retro-acting from the future which guides generating a field.

The biologist Rupert Sheldrake[36] refers to the theory of René Thom "*The theory of catastrophes*" which identifies the existence of attractors at the end of any evolutionary process.[37]

Thom introduced the hypothesis that the shape could be due to causes that act from the future and Sheldrake added the hypothesis of formative causation according to which morphogenesis (the development of the shape) is guided by attractors (i.e., retrocausal processes). The term comes from the Greek root morphe/morphic and is used to

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[36] Sheldrake R. 1981, *A New Science of Life: The Hypothesis of Formative Causation*, Blond & Briggs, London.

[37] Thom R. 1972, *Structural Stability and Morphogenesis*, in Benjam W. A. 1972, ISBN 0-201-40685-3.

emphasize the structural aspect.

Experimental results that can be easily explained in terms of attractors, were provided by Sheldrake.

Members of the same group, such as animals of the same species, are able to share knowledge, without using any physical transmission. Experiments show that when a mouse learns a task, this same task is learned more easily by each other mouse of the same breed. The greater the number of mice that learn to perform a task, the easier it is for each mouse of the same bread to learn the same task.

For example, if mice are trained to perform a new task in a laboratory in London, similar mice learn to perform the same task more quickly

in laboratories all over the world. This effect occurs in the absence of any known connection or communication between the laboratories.

The same effect is observed in the growth of crystals. In general, the ease of crystallization increases with the number of times that the operation is performed, even when there is no way in which these nuclei of crystallization may have been moved from one place to another infecting the different solutions.

Sheldrake explains these strange results introducing the concept of morphogenetic field:

"*Today, gravitational effects and electromagnetic ones are explained in terms*

of fields. While Newtonian gravity rose somewhat unexplained by material bodies and spread into space, in modern physics fields are the primary reality and by using fields we try to understand both material bodies and the space between them. The picture is complicated by the fact that there are several different types of fields. First there is the gravitational field (…) then there is the electromagnetic field (…) third, the quantum field theory (QFT), and so on."

Sheldrake's morphogenetic fields are a combination of the concepts of fields and energy.

Energy can be considered the cause of change. Fields can be considered the project, the way in which energy is

guided.

Fields have physical effects, but are not themselves a type of energy, they guide energy in a geometric or spatial organization.

The entropy/syntropy hypothesis translates the word fields into attractors and "morphogenetic fields" into "morphogenetic attractors" or "morphogenetic retrocausality." It agrees with the statement that morphogenetic fields would be at the basis of formative causation, morphogenesis, macroevolution, and the maintenance of the shape of living systems at all levels of complexity, not only on the surface, but also in internal processes.

Attractors provide the project and the design, with properties like those of Driesch's entelechy.

For example, in order to build a house, we need building materials and a project (an attractor) which determines the shape of the house. If the project is different, the same building material can be used to produce a different house.

When building a house there is a field that corresponds to the project. The project is not present in the building materials, which can therefore be used in many different types of projects. The project gives stability and leads the building material to converge and cooperate, despite individual differences.

The project represents the cohesive force of syntropy that brings parts together and contrasts the diverging tendency of entropy.

This example can be extended to cells, organs, trees, and living systems in general. For each species, for each type of cell and organ there is at least one attractor which coincides with what is normally called a field. Each morphogenetic field would correspond to a project that drives the living system towards a specific form and evolution.

In 1942, Conrad Waddington coined the term *epigenetics* to describe the branch of biology that studies the causal interactions between genes and phenotypes, i.e., the physical

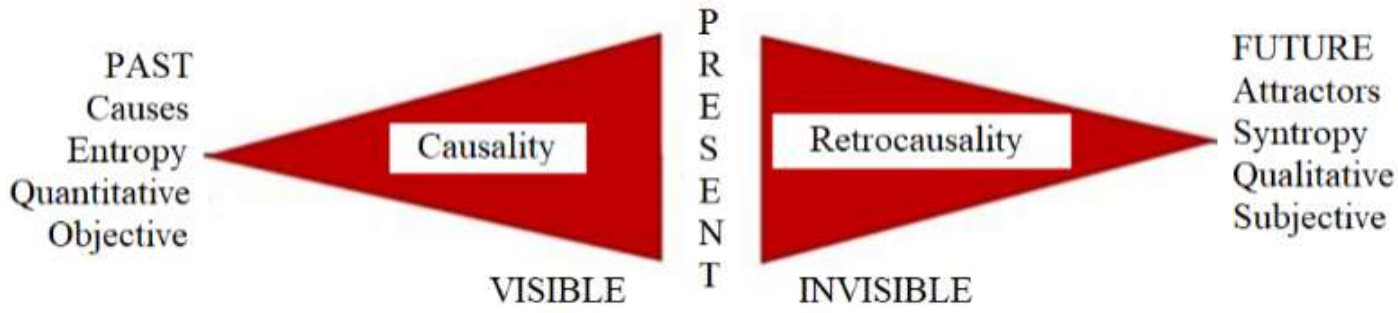
manifestation of the body. According to epigenetics, phenotypes are the result of inherited genetic mutations. These mutations last for the entire life and can be transmitted to the following generations through cell divisions. However, the hypothesis that the features of life can be added by means of random mutations contradicts the law of entropy according to which the spontaneous formation of the smallest protein requires at least 10^{600} mutations. It should also be noted that epigenetics implies that some mysterious mechanism has placed the properties of life in genetic programs and genetic instructions.

According to the syntropy

hypothesis genes might not store information, but act as antennas that connect our cells, our body, to the projects stored in the attractors. When genes are broken the communication malfunctions, the project is not received correctly and cells are no longer finalizes, guided by the project.

The supercausal hypothesis reverses the traditional way of thinking and introduces the idea that intelligent causality retroacts from the future providing projects and guidance.

Whereas causality produces effects that diverge from the past, retrocausality produces effects that converge towards attractors.



Attractors are non-local. They select the information which is "*advantageous*" for life, changing it into in-formation, and share it instantaneously. As explained by Barrow and Tipler[38], in the *Anthropic Principle*, this mechanism has brought the Universe towards physical constants that happen to fall within the narrow range which is compatible with life. The Universe seems to be compelled (attracted) towards those conditions which favor life.

[38] Barrow J.D. and Tipler F.J. 1988, *The Anthropic Cosmological Principle*. Oxford University Press. ISBN 978-0-19-282147-8.

Shared in-formation is like what the *Quantum Hologram hypothesis*[39] describes. The idea of a holographic mechanism for conveyance of life designs goes back to the mathematical insights of Dennis Gabor[40] and quantum holograms by Dr. Walter Schempp[41], a mathematician at the University of Siegen in Germany. The term "Holographic" implies that processes are holistic and postulates that the whole is more than the sum of its parts since information spreads everywhere to entangle the parts. In

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[39] Mitchell E. 2008, *The Way of the Explorer*, www.amazon.com/dp/1564149773

[40] Gabor D. 1946, *Theory of communication*, Journal of the Institute of Electrical Engineers, 93, 429-441

[41] Schempp W. 1993, *Cortical Linking Neural Network Models and Quantum Holographic Neural Technology*. In Pribram, K.H. (ed.) Rethinking Neural Networks

this domain, space and time no longer exist and neither does causality in Aristotle's sense of efficient causation, whereas Aristotle's more comprehensive f formative causation is appropriate.

When attractors interact with physical systems, fractal geometry arises. A fractal is a geometric object that is repeated in its structure the same way on different scales, that has an aspect which does not change even if it is seen with a magnifying glass. This feature is often called self-similarity. The term fractal was coined by Benoît Mandelbrot[42] in 1975 and derives from the Latin word *fractus*

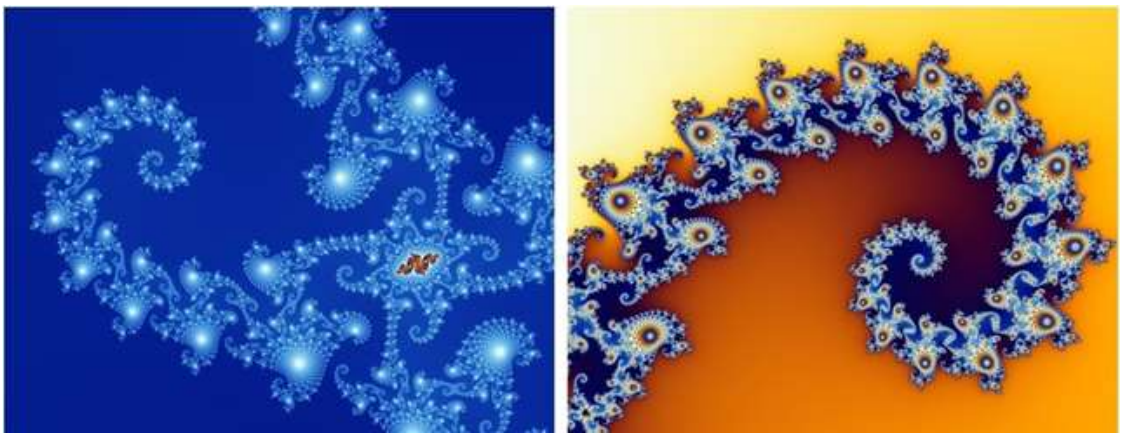
[42] Mandelbrot B 1982, *Fractal Geometry of Nature*, www.amazon.it/dp/0716711869/

(broken), similarly to the word fraction, since fractal images are mathematical objects of fractional dimension.

Fractals are often found in complex dynamical systems and are described using simple recursive equations. For example, if we repeat the square root of a number greater than zero (but smaller than one) the result will tend to one (but it will never reach it). Number one is therefore the attractor of this square root. Similarly, if we continue to square a number greater than one, the result will tend to infinity and if we continue to square a number smaller than zero, the result will tend to zero. As shown by Mandelbrot, fractal figures are

obtained when inserting in a recursive function, an attractor (an operator which tends to a limit). Complex shapes, and at the same time ordered, are obtained when an attractor is inserted.

Fractal geometry reproduces some of the most important structures of living systems, and many researchers have concluded that life follows fractal geometry: the outline of a leaf, the growth of corals, the form of the brain and the nervous terminations.



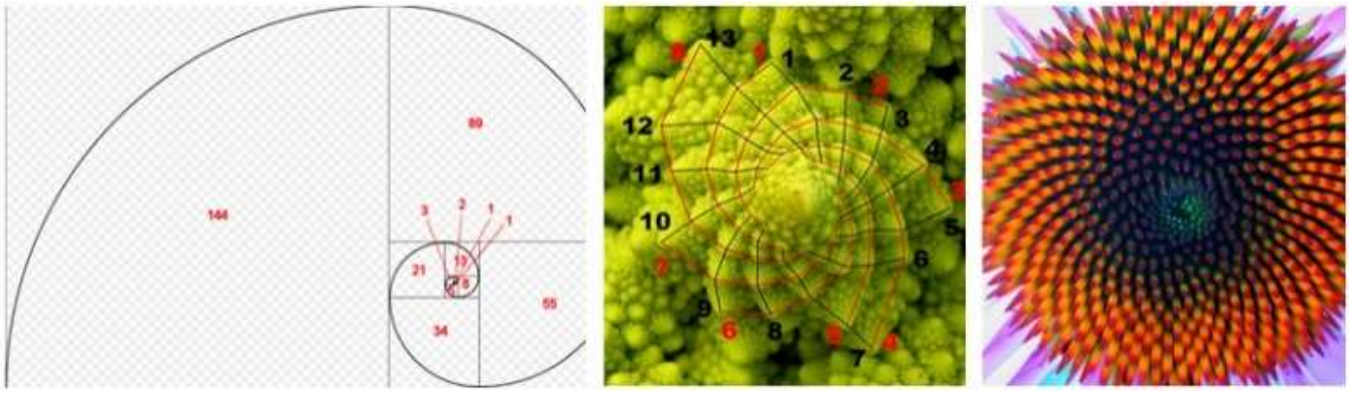
Fractal images

An incredible number of fractal structures has been discovered, for example blood arteries and coronary veins show ramifications which are fractals. Veins divide into smaller veins which divide into smaller ones. It seems that these fractal structures have an important role in the contraction and conduction of electrical stimuli: the spectral analysis of the heart frequency shows that the normal frequency resembles a chaotic structure. Neurons show fractal structures: if neurons are examined at low magnification, ramifications can be observed from which other ramifications depart, and so on. Lungs follow fractal designs which

can easily be replicated with a computer. They form a tree with multiple ramifications, and with configurations which are similar at both low and high magnification. These observations have led to the hypothesis that the organization and evolution of living systems (tissues, nervous system, etc.) is guided by attractors, in a similar way to what happens in fractal geometry.

Even before Leonardo da Vinci was exploring the fractal nature of rivers, trees and blood vessels, another Leonardo - named Leonardo of Pisa - was exploring fractal patterns in arithmetic. His book "*Liber Abaci*," published in the year 1202, under the pen-name 'Fibonacci', was significant

in the history of mathematics because it introduced the use of Arabic numerals into Europe, which would replace Roman numerals. Fibonacci described a sequence of numbers that would come to be called Fibonacci Numbers.



This sequence, which Fibonacci called *Modus Indorum*, method of the Indians, solved, a problem involving the growth of a population of rabbits based on idealized assumptions. In the Fibonacci sequence of numbers,

each number is the sum of the previous two numbers. Fibonacci ratio of consecutive numbers is known as the *golden ratio*.

Michelangelo used to state that the skill of an artist is to bring out from stone the figure that is already in it and does not belong to it. Similarly, the success of living species is to bring out the attractor, which is already present in them, but which does not belong to their body.

This explains the incredible stability of species and their convergence towards common forms.

EVOLUTION

Naturalism was born in the nineteenth century in opposition to the spiritualistic ideology of the Romantic period and is based on the premise that all the natural phenomena can be explained using causality. However, the energy/momentum/mass equation shows that classical causality is governed by the law of entropy, the tendency to dissipate energy and matter and to disintegrate any form of organization, whereas syntropy is a symmetrical type of causality, which is observed in living systems.

The biologist Jacques Monod (1910-1976) described the paradox between life and entropy, which is considered the law governing the universe, with the following words:

"Man must at last finally awake from his millenary dream; and in doing so, awake to his total solitude, to his fundamental isolation. Now does he at last realize that, like a gypsy, he lives on the boundary of an alien world deaf to his music, indifferent to his hopes, his sufferings, his crimes."[43]

Naturalism is based on causal explanations, based on laws governed by entropy, and leads to a vision of

[43] Monod J 1971, *Chance and Necessity: An Essay on the Natural Philosophy of Modern Biology*, New York, Alfred A. Knopf, 1971, ISBN 0-394-46615-2.

the universe in which life is highly unlikely, the result of chance and random mutations, without any purpose. Einstein used to say that the use of chance shows the incompleteness of a theory. "*God does not play dice!*". The use of chance puts naturalism in conflict with its fundamental premise, namely that all the natural phenomena can and should be explained using causality.

Syntropy extends causality to retrocausality and supercausality and shows that the properties of life, that naturalists attribute to chance, are manifestations of retrocausality and supercausality.

- The concept of species

Cataloging and classifying living organisms is one of the oldest and main objectives of biology and is referred to as "taxonomy". The term comes from the Greek word *taxis* (ordering) and *nomos* (rule). In biology, a taxon (the plural is taxa) is a taxonomic unit, a group of real organisms, morphologically distinguishable and / or genetically recognizable from others as a unit with a precise location within the hierarchy of the taxonomic classification. Carl Linnaeus (1707-1778), the father of taxonomy, based the classifications mainly on the external features of living things and

this procedure is sometimes referred to as “Linnaean taxonomy”. Only later taxonomy was expanded to anatomy, i.e. the skeleton and soft parts, and molecular and genetic information. Morphological taxonomy attempts to classify living beings according to their similarities, using neutral and objective descriptions.

Taxonomy is an empirical science which uses ranks, including, among others: kingdom, phylum, class, order, family, genus, species. In zoology, the nomenclature for the more important ranks is strictly regulated by the ICZN Code (International Commission on Zoological Nomenclature), whereas taxonomy itself is never regulated, but

is always the result of research in the scientific community. How researchers arrive at their taxa varies. It depends on the available data, and resources and methods can vary from simple quantitative or qualitative comparisons of striking features to elaborate computer analyses of large amounts of DNA sequence data.

For this reason, researchers can produce different classifications due to a series of subjective choices. For example, depending on which features we choose to consider, the classifications can change. The similarity values used in statistical analyses can be changed, and this can lead to place individuals into taxa that

are close to the critical values of similarity.

To overcome the limitations of subjective choices genetic taxonomy was developed. Genetic taxonomy is based on the idea that couples that produce fertile progeny belong to the same taxa. The genetic approach classifies species according to their ability to produce fertile offspring under conditions of natural life. If organisms produce fertile offspring only when artificially crossed, in captivity or breeding, they are counted in different species. For example, a mule is the product of a horse and donkey and is barren. The genetic approach therefore leads to

catalog horses and donkeys as different species.

Biological taxonomy is therefore divided mainly into morphological taxonomy, which considers the external features (morphospecies) and genetic taxonomy which considers fertility (genospecies). Depending on whether the emphasis is put on the genetic (fertility) or morphological (features) the boundaries between species can vary. In the case of donkeys and horses there are two genospecies and one morphospecies, since they are indistinguishable based on their external features, and therefore belong to the same morphospecies, but do not produce fertile offspring, and therefore do not

belong to the same genospecies. To overcome this discrepancy, the base type of classification was introduced which considers both classifications: the reproductive behavior and the morphological features. However, even the base type of classification has not managed to produce generally accepted taxa.

The geneticist W. Gottschalk says

"*Despite decades of research, the definition of species as a biological unit presents great difficulties. To date there is still no single definition that meets all the requirements.*"

The common definition of species, genospecies, morphospecies and base type, are imprecise since they do not

permit a clear and always valid delineation among taxa. By applying different definitions of species, inevitably the boundaries change. This raises the question whether it is possible to define higher taxonomic units that encompass the concepts of both genetic and morphological species.

- Microevolution

Charles Darwin (1809-1892), in *The Origin of Species* (1859), described the variability among species and the fact that in the long-term population size remains constant, despite the overproduction of progeny. Darwin

concluded that only the best and fittest individuals survive and become the parents of the next generation. This process of natural selection would be enhanced by genetic drift, i.e., the tendency of alleles, which are responsible for the particular ways in which the hereditary features manifest, to randomly combine during reproduction. Positive combinations would increase the chances of survival and would be therefore selected, becoming a common feature.

Only random variations (mutations) which directly or indirectly benefit the possibilities of survival and contribute to evolutionary progress are selected whereas deleterious mutations are

mostly eliminated. This mechanism favors advantageous mutations and plays an important positive role in the evolutionary process. For Darwin, natural selection and genetic drift are the key elements of the evolutionary process.

However, it is generally accepted that the mechanism of natural selection and genetic drift operate only within the context of microevolution.

The terms microevolution and macroevolution were introduced in 1927 by Philiptschenko, where:

- *Microevolution* indicates the selection of features within the same species, for example: quantitative changes of organs and structures of existing bodies.
- *Macroevolution* indicates the evolution of new features, for example: the development of organs, structures, and forms of organization with qualitatively new genetic material.

The function of microevolution is to optimize existing structures, while the function of macroevolution would be to develop for the first time, or from scratch, structures with new functions.

An example of microevolution is provided by seeds carried by wind, which fail to germinate in soils polluted by heavy metals. In landfills in Britain, it was observed that a minority of seeds can germinate, grow, and make seeds that can colonize soils polluted by heavy metals. These offspring show the inability to re-cross with their parental plants growing on normal uncontaminated soils. Based on the definition of genospecies, one can therefore say that a new species is born.

Can these processes be used as evidence of the development of a new specie with new information?

Genetic analysis shows that these new plants, that can grow on contaminated soils, have not developed a new character, but the tolerance to the high content of heavy metals derives from the fact that the absorption of minerals from the soil is limited. The genetic information has been limited, and it is not an evolutionary progress due to new information. The example of plants colonizing mine landfills, as well as other examples of this type, proves that the process of microevolution should not be considered a development towards higher forms, but an impoverishment of the genetic information. These plants are more tolerant to heavy metals but are less

adjustable to environmental changes and are more at risk of extinction. When this process of selection is repeated, it results in massive depletion of the genetic information. These new breeds are more suited to specific environments, more specialized, but also less flexible.

Another example of microevolution is provided by the cheetah, the fastest mammal on the planet. The depletion of the genetic information, due to specialization, is not reversible and tends to bring this specie to extinction. Despite its extraordinary abilities as a predator, the cheetah is endangered because of its very low genetic variability and information which makes the species all very

similar. This specialization leads to illnesses, a high percentage of abnormal sperm, the fact that after hunting these predators are so tired that they become unable to defend their prey from other competitors, such as lions, leopards and hyenas, and an insufficient capacity for adaptation that increases the risks of extinction.

Speciation, i.e., the formation of new species, observed to date is limited to microevolution processes of specialization governed by natural selection which selects the genetic potentials of species. Observations suggest that species start from a condition in which large quantities of genetic information and potential is

available; gradually this potential is reduced because of natural selection, guided by events of colonization and isolation. This reduction of the original variability of genetic information allows the colonization of new habitats, but limits future possibilities of adaptability. Speciation, as it is known today, is based on the loss of genetic information due to environmental conditions and the processes of specialization.

An important role in microevolution is played by genetic drift, i.e., by the recombination of parental genes during sexual reproduction that leads to the formation of a virtually unlimited number of new

combinations. The biological importance of sexual reproduction is explained by the fact that it enhances the possibilities of natural selection. But, since genetic recombination does not produce anything new, natural selection is confined only within microevolution. No new genetic material is formed, but only pre-existing genes and alleles are recombined, mixed, and selected.

- Macroevolution

Unlike microevolution, which is based on genetic drift, natural selection and speciation which progressively reduce the genetic

information, macroevolution requires mechanisms that can increase and produce new information. However, so far, only microevolution processes of specialization have been observed. Evolutionary factors such as natural selection, genetic drift and isolation do not provide explanations regarding macroevolution. Consequently, the term macroevolution is understood in very different ways:

- Some authors use it to indicate mechanisms other than Darwin's gradualism which are insufficient to explain the development of new complex organs (such as the development of wings or legs, etc.).

- Others use it in a descriptive way, without any comment on the mechanisms.
- Some use it to indicate evolution beyond the species level. The difference between microevolution and macroevolution becomes the border between species.
- Sometimes a distinction is made by discipline: macroevolution is studied by paleontologists whereas microevolution by biologists.
- The boundaries between micro and macroevolution are fluctuating and it is not possible to distinguish between these two terms.
- Others reject the term macroevolution on the grounds

that there is only one evolutionary mechanism.

Genetic mutations appear spontaneously in nature (without apparent causes) and can also be artificially induced or favored, for example by treatment with chemicals, radiation, and temperature changes. However artificial mutations limit evolution to the field of microevolution. Empirical findings show that these mutations help explain the separation of a parental species into two or more species (speciation), but they do not explain the increase in information. Offspring specialize in different directions but cannot increase their information.

One wonders then:

- if there are known mechanisms that explain macroevolution.
- if there are clues that suggest that macroevolution is possible.
- if the equation *microevolution* + *time* = *macroevolution* is correct.

A first consideration about the action of natural selection is that a series of mutations that should initiate the development of a new organism (macroevolution) would survive only if every single change causes a selective advantage or, at least, not a disadvantage. This means that the evolution of a new organ or structure

cannot go through intermediate stages which are disadvantageous and would not survive natural selection. Living systems must be able to survive in each stage of the evolutionary process. For this reason, it is difficult to explain the development of complex organs, since the intermediate stages would result in a disadvantage which would be eliminated by natural selection.

In the formation of new organs and structures, in general, a selective advantage is given only after their completion. The early stages of a new body represent a pure waste of material and until the process is completed do not offer any selective advantage. Therefore, incomplete

intermediate forms would be eliminated by the mechanism of natural selection. The biological value of an organ is given only when the various functions can interact. Simulating the evolution of new organs using computer software, advantageous intermediate stages should be achieved in a very limited period of time; but neither the computational nor biological models can account for these quick intermediate stages of evolution. Advantageous intermediate stages require information on mechanisms, rates of mutation and recombination, suitable and appropriate selection criteria, and population size, which in simulations need to be introduced

artificially (from outside) showing that the processes of macroevolution require good technology, good programs and software, but there is no known natural source that can provide these resources, programs and information. From the evolutionary point of view, the unsolved question is not about the existence of advantageous mutations, but the possibility of the development of new genetic material and new structures.

Darwin believed that similar features are hereditary, for example children resemble their parents, and for this reason he argued that similar species, such as chimpanzees and humans, should have common ancestors. This

hypothesis requires the existence of numerous intermediate links which should testify the evolution between chimpanzees and humans, but these links are missing and have not been found so far. Occasionally there are fossils that are interpreted as links, but their interpretations have resulted fundamentally controversial. Phylogenetic theory cannot completely ignore the fact that these links are missing. Darwinists try to explain their absence by saying that evolutionary processes took place in marginal populations with a low probability of fossilization.

The theory of macroevolution also maintains that affinities should be interpreted as convergences. But how

can an evolutionary process without a tendency converge towards similar results? The convergence is usually explained by saying that evolution has been strongly channeled by similar selective processes. But fossils show that regarding size, morphology, ecology, stages of development and reproduction, old species cannot be distinguished from recent ones.

While biology examines living species, paleontology studies the world of plants and animals which existed on our planet in the past, and it is therefore considered to be a science of origins and evolution. According to the macroevolution doctrines, each type of organization would have developed gradually, and

links existed between and among different types, gradually developing in higher forms and organisms. But paleontologists have failed to provide any evidence for the existence of these links. On the contrary, they have provided evidence of a substantial constancy of species.

For example: the major groups of plants appear suddenly and not in a gradual way and species often appear in the wrong chronological order (the most complex and evolved appearing first). Within the same taxa, it is usually impossible to show a trend from simple to complex, for example, under the Psilophyton taxa, the oldest forms are the most complex in the stratigraphic sequence. In most cases,

family trees can be reconstructed only if we admit the possibility of convergence and reversions (i.e., the return to original features). According to generally accepted studies, spores appear before macrofossils (wood, leaves, etc.). No one knows why this could have happened.

- Macroevolution and converging evolution

The paleontologist and Jesuit Pierre Teilhard de Chardin (1881-1955) argued that while astronomy detects an initial event from which the physical world originated (the Big Bang), paleontology identifies an end point towards which life is evolving

and converging. Teilhard named this end point the Omega point and stated that a correct reading of sacred texts shows that the origin of life is in the future and not in the past. Teilhard's claims have sparked debate within the Catholic church and a decree of the Holy Office chaired by Cardinal Ottaviani, in 1958, imposed religious congregations to withdraw the works of Teilhard from all their libraries. The decree states that the texts of the Jesuit "*offends Catholic doctrine*" and alerted the clergy to "*defend the spirits, especially of the young, from the dangers of the works of father Teilhard de Chardin and his disciples.*" However, Cardinal Ratzinger, Pope Benedict XVI, in Principles of

Catholic Theology (1987) admitted that one of the main documents of the Vatican, *Gaudium et Spes*, was strongly influenced by the thought of this Jesuit. Benedict XVI also said that Teilhard had a "great vision" that "at the end will lead towards a true cosmic liturgy."

Teilhard's thought was influenced by Eastern doctrines. For example, in the Koran, verbs are always used in the past tense, because God speaks from the future. Islamic doctrine describes a humanity that evolves towards God.

Teilhard was a well-known evolutionary scientist and became famous after his death with the publication of his books, among

which "*The Phenomenon of Man*" and "*Towards Convergence*". Both Fantappiè and Teilhard were subject to strong censorship since their theories broaden science to a new type of causality which retro-acts from the future. According to Fantappiè life is subject to a dual causality, efficient causality, and final causality, and for Teilhard life is guided by final aims which converge in the Omega point. Both authors identified the source of life with the energy of Love.

According to Fantappiè:

"*Today we see printed in the great book of nature - that Galileo said, is written in mathematical characters - the same law of*

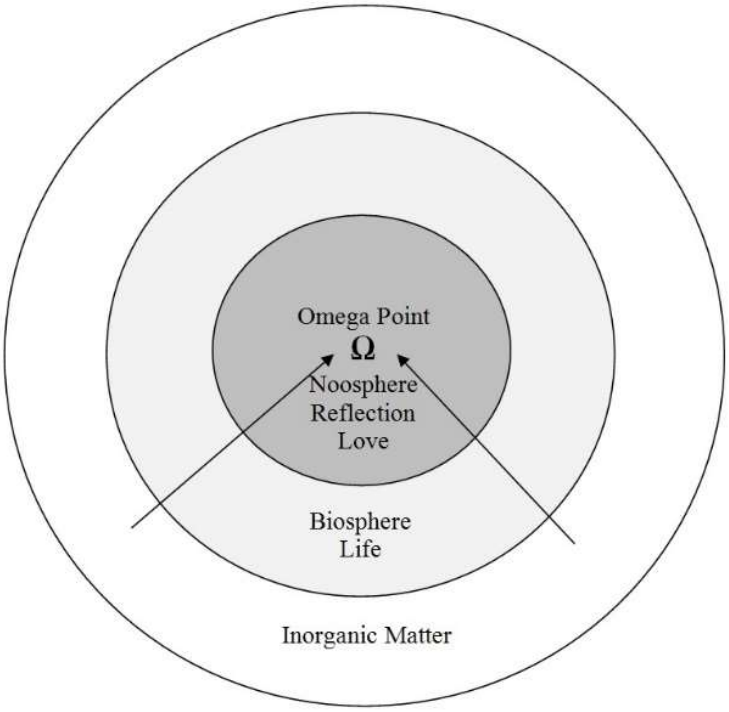
love that is found in the sacred texts of the major religions."

For Teilhard:

"*The universe, taken as a whole, concentrates under the influence of the attraction which arises from the Omega point, which takes the form of love. People can evolve and become more human since they share at the core level the same attractor of love.*"

Teilhard considered evolution organized on three main concentric spheres. The innermost sphere is the Omega point, the final attractor, in which all of matter will be transformed into organic and

conscious matter. The outer sphere is the most distant from the Omega point, the realm of inanimate matter. The middle sphere is the realm of life which does not yet reflect on itself, the biosphere.



Teilhard believed that:

"*Evolution cannot be measured along the line that goes from the infinitely small to the infinitely big, but according to the axis that goes from the infinitely simple to the infinitely complex. We can represent evolution as distributed on concentric spheres, each of which has a radius that diminishes as complexity grows.*"

In his childhood Teilhard's idol was represented by solid matter: the "*God of Iron*". He soon reached the conviction that the consistency of solid matter was not given by the substance itself, but by a converging force. The theme of convergence became one of the fundamental concepts of Teilhard's vision.

Teilhard relates the Omega point to consciousness a universal property, a cosmological property of the universe which arises while converging towards unity and increasing complexity.

"*Consciousness increases in proportion to the complexity of life. Consciousness is absolutely inaccessible to our means of observation at the small level of viruses, but it clearly appears at the maximum level of complexity of the human brain.*"

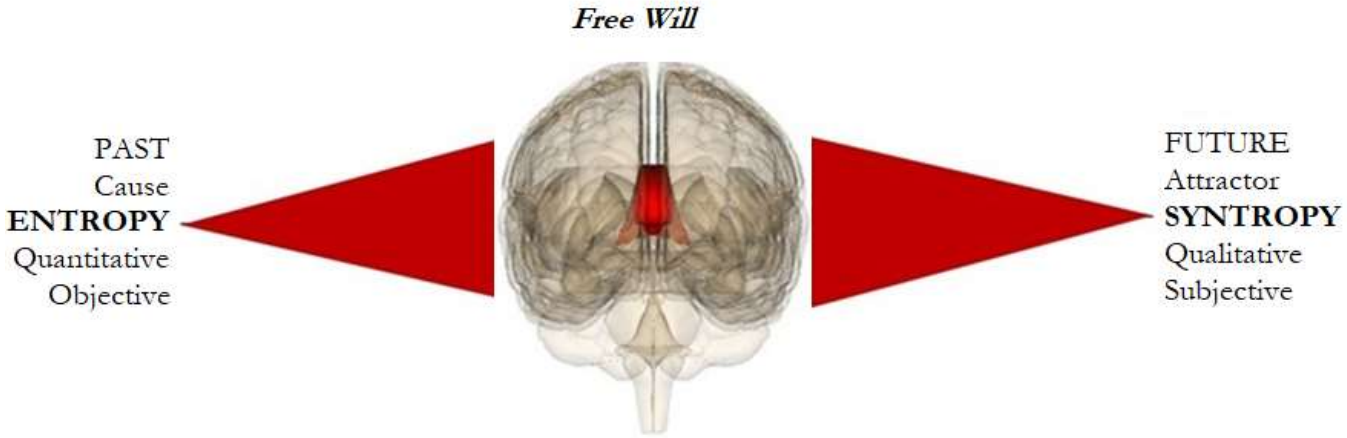
CONSCIOUSNESS

Starting from the dual solution of the energy/momentum/mass, the present moment is described as the meeting point of information arriving from the past and in-formation arriving from the future. The mathematician Chris King speculates that free will arises from the constant interaction between these two types of information: objective and quantitative coming from the past and subjective and qualitative coming from the future. Living systems would constantly be in a state of choices and free will would be the result.

Since the forward and the backward-in-time solutions are perfectly balanced, a similar amount of information is received from the past and from the future. This would be the reason of the perfect division of the brain in two hemispheres.

The previous figure can, therefore, be replaced with the figure of the two cerebral hemispheres, where the left

hemisphere is the seat of logical reasoning, rationality and language, and the right hemisphere processes emotions, intuitions, images, symbols, and colors.



The forward in time solution takes the form of causes, experience, learning, beliefs, representations of the world, while the backward-in-time solution takes the form of attractors which can be felt like

emotions, inspirations, insights, intuitions, and presentiments.

Syntropy introduces the autonomic nervous system in this design and, more specifically, the solar plexus. The solar plexus connects us with the attractor, the source of syntropy, and would therefore be the seat of the "*feeling of existence*", the "*feeling of life*". The brain, on the other hand, would be involved in free will.

According to this approach the mind is organized on three levels: the conscious mind (linked to the head and free will), the unconscious mind (associated with the autonomic nervous system and highly automated

processes) and the super-conscious mind (associated with the attractor, oriented to the future that provides a purpose and a meaning to our existence).

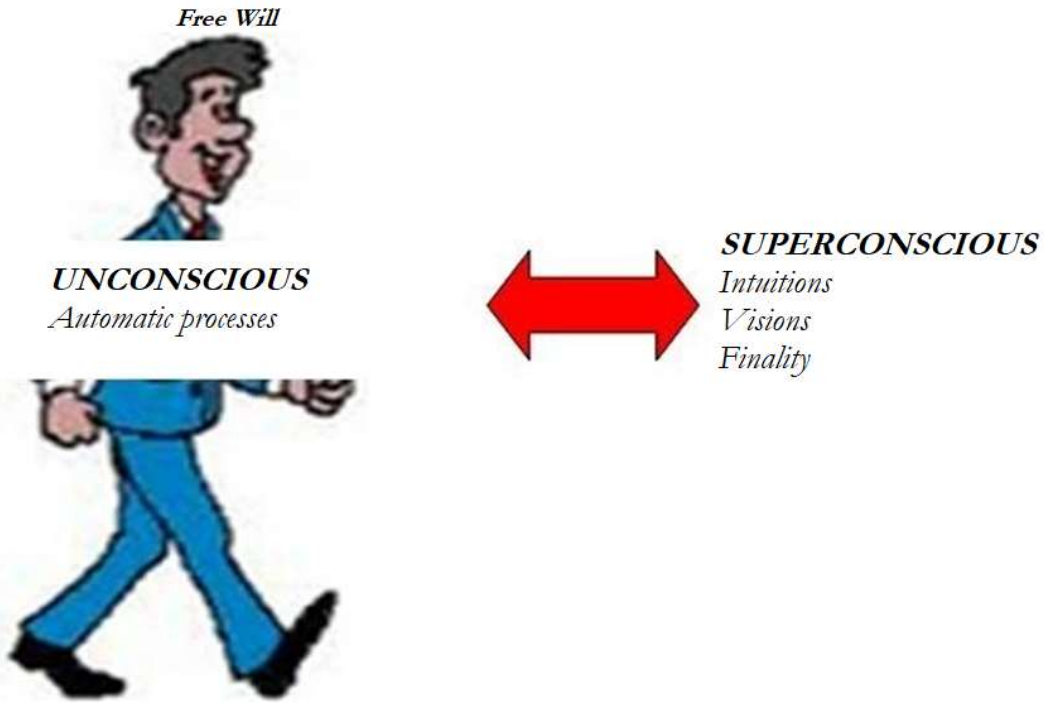
The *conscious mind* on which we are tuned during the time we are awake, connects us to the physical reality of existence. The conscious mind mediates feelings that come from the autonomic nervous system, i.e., the unconscious mind, with information that comes from the physical plane of reality. The conscious mind is characterized by free will.

The *unconscious mind* governs the vital functions of the body, therefore called involuntary, such as heartbeat, digestion, regenerative functions,

growth, development, and reproduction. In addition, it implements highly automated programs, which allow us to perform many complex tasks, without having to think continuously about them, such as walking, riding a bicycle, driving, etc. The autonomic nervous system supplies the body with syntropy, and it is therefore the seat of feelings. The unconscious mind can be accessed during dreams or using techniques of relaxation and altered states of consciousness such as hypnotic trance.

The *superconscious mind* is that part of our being that is in direct contact with the attractor. The attractor is the source of syntropy, and of the energy

of life and is fundamental for our wellbeing and evolution. The superconscious mind shows the way, solutions, answers, and it is the source of inspiration and insight for the conscious mind, providing knowledge and intelligence which allow to solve problems. It sends messages through dreams, or in the form of feelings of anticipation, presentiments, insights, and inspirations.



- The conscious mind and free will

The conscious mind must constantly choose between information from the future and from the past, and is characterized by processes of evaluation, which are at the basis of free will and decision making. Information coming from the future acts as a *pull* factors, typically referred to as feelings of the heart which direct and pulls us towards the attractor. Information coming from the past acts as a *push* factors, typically based on memories, experiences and knowledge. We are constantly mediating between these pull and push factors.

This duality cohabits in our mind and is characterized by the specialization of the two cerebral hemispheres. The cortex is not a single block, but split in the left hemisphere which is the seat of logical reasoning, rationality and language, and the right hemisphere, which is associated with emotions, feelings, intuitions, global processing, analogies, symbols and colors.

The left hemisphere deals with the external and material world, characterized by objective information and analytical rational thinking, whereas the right hemisphere deals with our inner world, characterized by feelings, intuitive processes, symbols, and

images. Western culture has increasingly focused on rationality, diagrams, demonstrations of the real world, and considers writing and technical data the inner essence of things. We can describe an object in its characteristics, we can use standardized symbols to represent them, we attempt to reconstruct retrospectively the parts of a whole by the analytical process of rationality, however we are not able to look at objects and ourselves from the inside and reach the essence of reality.

Generally speaking, we tend to overlook intuitions, since it is widely believed that life must be based only on facts, models and information which derive from the past. This

attitude has gradually led to abandon insights, inspirations, and dreams, with the result that choices are now made considering only push factors, governed by the law of entropy, and not the pull factors governed by the law of syntropy.

- The unconscious mind and the autonomic nervous system

The autonomic nervous system oversees acquiring syntropy and distribute it to the vital processes in the body nourishing regenerative and healing processes and connecting the individual with the attractor which guides all those processes that give

shape, organization, and structure to the physical body. According to the theory of syntropy, the design is contained in the attractor which retroacts from the future via the autonomic nervous system and DNA.

When we try to explain the complexity and order of genetic information solely because of past causes, we face a series of logical contradictions and paradoxes. Since the processes of random genetic mutation are governed by the law of entropy, they can only lead to a gradual increase of the structural differences between individuals, thereby preventing the formation of species. However, in the real world we witness just the opposite, namely an

incredible convergence of biological structures towards common designs, despite individual differences. For example, we can indicate different races of human beings, such as Europeans, Asians, Africans, but there is something that unites all of these individuals, and that makes them all part of the same species. Considering only the information from the past and the cause-effect logic, it is impossible to explain either the convergence of different individuals towards the same species, or the stability of species in time.

The theory of syntropy suggests that the design of species should be sought in the influence of attractors which retroact from the future and attractors

would act as bridges between individuals of the same species. An example of this process is provided by the experiments conducted by Sheldrake, who showed that learning a task is spread (in an invisible and immaterial way) to all the other individuals who belong to the same species and not among individuals of different species. When a common attractor exists, learning and discoveries of one individual are disseminated to the other individuals. What creates the bridge between individuals is the attractor that they share. Sheldrake conducted a series of experiments that show that members of the same attractor, such as animals belonging to the same species, can

share knowledge without any physical contact between themselves or through any way that may allow the transition of knowledge and information. These experiments are very simple, animals learn a new behavior which is useful for their life, and other animals that belong to the same species show a tendency to learn the same behavior more quickly.

The converging evolution hypothesis suggests that attractors acquire experience from individuals and select solutions which are advantageous translating it into in-formation.

The verb “to inform” can be originally related to the expression “to

model according to a form". In fact, "to inform" derives from the Latin term "in-formare", that means "to give a form". Aristotle believed that "In-formation" is a fundamental activity of energy and matter that encompasses a modality that precedes every physical form. Once there is a form, the potential information can express through one of its possible manifestations.

The autonomic nervous system plays a key role with in-formation since it connects the individual to the attractor and provides designs and solutions to all the vital processes. This occurs at the level of the unconscious mind; despite the

incredible amount of intelligence, it requires. The autonomic nervous system, i.e., the unconscious mind:

- Is guided by emotions and feelings of anticipation that lead towards specific forms and solutions.
- It provides syntropy, vital energy, to the various organs of the body and performs healing actions based on the designs received from the attractor.
- It behaves like a mechanic who consults the book of the manufacturer to perform repairs and maintain the system as close as possible to the project. The project is not mechanical, and instructions

are written with the ink of emotions.

- It underlies all the involuntary functions of the body and is responsible for controlling the motion of muscles and limbs.
- It governs all the functions of the body that are not subject to choose and which do not require the conscious level. For example, it is responsible for digestion, heart rate, assimilation of food, cell regeneration. These are processes which are completely unknown to our conscious mind. We do not know how they are carried out and, often, we do not even know that they exist. It is not necessary to be

a doctor or a biologist to digest food or regenerate a tissue. The body knows everything independently and shows an extraordinary level of intelligence.

- It directs and regulates these processes, thereby expressing the capabilities and potentialities of an intelligence which is incredibly higher than our conscious mind.
- It memorizes learning patterns of behavior which it then executes autonomously and automatically, and which are maintained over time, giving rise to habits and learning. This memory is then stored, at least in part, in the

muscles of the body in the form of patterns of behavior.

- It repeats behavioral patterns, until they become habits that are activated automatically, regardless of our will. These patterns are then placed firmly in the memory of the unconscious mind. The conscious mind often does not remember what was included in the memory of the unconscious mind. Consequently, the unconscious mind can open incredible sceneries in the processes of knowing ourselves.
- The unconscious mind also acts as a guardian of any information that the conscious mind cannot handle.

- The superconscious mind and the attractor

The superconscious mind has its origin in the attractor, is outside our physical being and is connected to our body via the solar plexus (i.e., heart). Since syntropy acts as an absorber and energy concentrator, the good functioning of the superconscious mind is associated with feelings of warmth located in the heart area. These feelings of warmth coincide with the experience of love. In contrast, a weak functioning of the superconscious mind is associated to feelings of void (entropy) and pain usually named anxiety and anguish, accompanied by symptoms of the

autonomic nervous system, such as nausea, dizziness, and feelings of suffocation. The superconscious mind allows to experience visions of the future, intuitions, and inspirations, which are inaccessible to the ordinary states of the conscious mind. It is a state of consciousness that leads to a higher level of awareness. Everyone constantly interacts with the superconscious mind which illuminates the direction, provides aims and the mission of our life. We enter in contact with the superconscious mind through our solar plexus in moments of silence, when we avoid the use of substances such as alcohol, tobacco, drugs and coffee, and when we avoid activities

and habits which distract us from our inner feelings. The superconscious mind is available to everyone, and acts as an inner teacher, always ready to cooperate with us and guide us towards the solution of problems and towards happiness.

Henri Poincaré, one of the most creative mathematicians of the last century, observed that when faced with a new problem whose solutions can be countless, a rational approach is initially used, but being unable to arrive at the result another type of process is activated. This process selects the correct solution among the endless possibilities, without the help of rationality. Poincaré called it

intuition (combining the Latin words *in*=inside + *tueri*=glance), and was struck by the fact that they are always accompanied by experiences of truth, beauty, warmth, and well-being in the thoracic area:[44]

"Among the large number of possible combinations, almost all are without interest or utility. Only those that lead to solving the problem are illuminated by an interior experience of truth and beauty."

For Poincaré, intuitions require attention and sensitivity to these feelings of truth and beauty, which connect us to the future, to the

[44] Henri Poincaré, Mathematical Creation, from Science et méthode, 1908.

intelligence of syntropy.

Robert Rosen (1934-1998), theoretical biologist and professor of biophysics at the Dalhousie University, in his book *Anticipatory Systems*[45] wrote:

"I was amazed by the number of anticipatory behaviors observed at all levels of the organization of living systems (...) that behave like real anticipatory systems, systems in which the present state changes according to future states, violating the law of causality according to which changes depend exclusively on past or present causes. We try to explain these behaviors with theories and models that exclude any possibility of anticipation.

[45] Rosen, R., *Anticipatory Systems*, Pergamon Press, USA 1985.

Without exception, all biological theories and models are classic in the sense that they seek only causes in the past or present."

To make anticipatory behaviors consistent with the idea that causes must always precede effects, predictive models and learning processes are considered. But anticipatory behaviors are found also in the simpler forms of life, such as cells, without neural systems, and in these cases, it is difficult to sustain the hypothesis of predictive models or learning processes. Furthermore, they are also observed in macromolecules, and this excludes any possible explanation based on innate processes due to natural selection. Rosen

concludes that a new law of causality is needed to explain the anticipatory behaviors of living systems.

- When does consciousness end?

The entropy/syntropy hypothesis of the mind is heart centered and sees the brain as a servant of the heart. On the contrary consciousness is usually associated to the brain and it is widely believed that when the brain stops working consciousness ends and the person can be considered dead.

The concept of brain death has been officially formalized in 1968 at the time of the first transplant of organs, as the criteria of natural death (end of

heart activity and blood circulation) does not allow organ transplants. The concept of brain death provides the legitimacy necessary to perform transplants and the first official definition of brain death was developed by an ad hoc committee set up at the Harvard Medical School. The 1968 Harvard criteria for brain death determination have now become the bases for national laws. These criteria establish when it is permissible to "unplug" and consider the patient "legally" dead. The Harvard criteria are also the bases for the laws on organ transplantation since organs are removed when the heart is still beating.

Evidence that brain death is not valid

criteria are suggested by the fact that:

- when explanting organs from a person who is legally defined as dead (low EEG activity) the person starts defending and screams and must be tied to the operating table to allow to remove the organs.
- an awesome number of people, who had been diagnosed with brain death, awake in full consciousness.

In 1985 the Vatican accepted the Harvard Report and in 1989 Pope John Paul II talked on the topic on several occasions legitimating the removal of organs from warm bodies, even though they are still breathing

and with their hearts beating.

On September 3, 2008, in the front page of the official Vatican newspaper, "*L'Osservatore Romano*", Lucetta Scaraffia wrote an editorial dedicated to the forty years anniversary of the Harvard Report which introduced the definition of brain death. In this editorial she declared that brain death cannot be used to assert the end of a life and the definition of death should be reviewed in the name of new scientific assumptions.

The reactions of the Western medical / scientific world were immediate: "*The criteria for brain death are the only scientifically valid criteria in order to sanction the death of an individual.*"

Moreover: "*The worldwide scientific community approves the criteria established by the Harvard report and the criticism that comes from fringe minorities, are based essentially on non-scientific considerations.*"

Finally: "*Scientifically advanced countries have accepted as the norm all the criteria of brain death.*"

A book edited by Paolo Becchi: "*Brain death and organ transplantation. A question of legal ethics*" contains the statement of Hans Jonas who argues that the definition of death established by the Harvard report was motivated not by scientific discoveries, but by the need for organs for transplantation.

In 1989, the Pontifical Academy of

Sciences had already addressed the question and Professor Josef Seifert, Dean of the International Philosophical Academy of Liechtenstein, was the only one to object to the definition of brain death.

But, when the Pontifical Academy of Sciences met again to discuss the issue, on 3-4 January 2005, the positions reversed. The participants, philosophers, jurists and neurologists from various countries, agreed that the criterion of brain death is not scientifically credible and should therefore be abandoned.

These results were unacceptable for Marcelo Sánchez Sorondo, chancellor of the Pontifical Academy of Sciences, and the proceedings of the

meeting were not published. Several speakers gave their papers to an outside publisher, Rubbettino, and a book was published with the Latin title *Finis Vitae*, edited by Professor Roberto de Mattei, deputy director of the Italian National Research Council.

Experiments focused on the autonomic nervous system, suggest that consciousness resides in the heart area and not in the brain. Rita Levi-Montalcini describes this contradiction with the following words:

> "*Everyone says that the brain is the most complex organ of the body. As a doctor I might agree! But as a woman, I assure you that there is nothing more complex than*

the heart; its mechanisms are still unknown. In the brain there is logical reasoning, in the reasoning of the heart there are feelings."

- Heart or Brain?

Heart or Brain? This is one of the main differences between the West and the East. The West is brain-centered whereas Asia and especially China are heart-centered. An example is provided by the term consciousness. If you copy the ideogram 心 in Google translator you obtain the following translations: bosom, center, core, feeling, thinking

and intelligence. These are some of the main properties of what in the West we call consciousness. But the ideogram 心 indicates the heart! Chinese ideograms constantly associate consciousness to the heart!

Consequently, in China a person is considered alive and conscious until the heart beats and explanting organs from warm bodies is considered an execution. This is one of the reasons why in China organs for transplants are provided only by prisoners who, before their execution to death, agree to donate organs.

In Chinese ideograms consciousness is described using two ideograms: the

ideogram of the heart 心 (xin) and the ideogram of the head 头 (tou):

心头

The heart is placed in the first position, thus telling that the essence of consciousness is the heart, whereas the head is placed in the second position, thus suggesting that it is a tool of consciousness.

It is also remarkable to note that in Chinese ideograms an “idea” is the combination of the heart on the left and the ideogram “to think” 想 on the right. The ideogram “think” contains

the ideogram of the heart as a radical:

心想

When we communicate our thoughts to someone we have at the left “message” 信 and at the right the heart. In other words, our thoughts are “messages from the heart”:

信心

For insights and intuitions on the left of the heart there is the ideogram warmth. Intuitions are described as feelings of “warmth in the heart”:

热心

Being diligent, attentive, devoted to a project is described as “eye of the heart”:

目心

When during our business we are scrupulous we use the ideogram “a lot” associated with the heart:

多心

When we become actors of our choices, of our free will, we use the

ideogram “force” associated to the heart, “a strong heart”:

心力

However, when we are depressed, we talk about “grey heart” a “heart with no color”:

心灰

Finally, when we can solve a problem, we talk about a “peaceful heart”:

心安

Ideograms suggest that when it comes to consciousness, attention should shift from the head to the heart.

This same consideration can be found in many ancient civilizations. In ancient Egypt the heart was the seat of consciousness, whereas the brain was considered unnecessary fat material. In ancient Greek, Roman, Indian, Arab, and Jewish civilizations, the scientific, medical, philosophical, and mystical systems considered the heart the seat of consciousness, whereas the brain was a tool, the servant of the

heart.

- Consciousness: cause or effect of reality?

In 1927 the physicists Niels Bohr and Werner Heisenberg developed the Copenhagen Interpretation of quantum mechanics. This interpretation rejects the backward-in-time solution of the Klein-Gordon equation and is based on Schrödinger's wave equation, which excludes special relativity and treats time in the classical way, with causes which always precede effects, dismissing in this way the possibility of retrocausality.

In order to explain the mysteries of quantum mechanics, such as the wave-particle duality, Bohr and Heisenberg attributed to consciousness the property of creating reality. The Copenhagen Interpretation soon became popular, probably because it embodied the spirit of the times, the *zeitgeist*, which wanted men to be godlike, with the power of creating reality through the exercise of consciousness. Although Nazism was defeated 70 years ago, theories of consciousness are now mainly based on the hypothesis of the collapse of the wave function. This hypothesis requires that consciousness is a prerequisite of reality.

The theory of syntropy, by contrast, sees consciousness as a result of the cohesive properties of the backward-in-time solution of the fundamental equations, and the encounter of these properties with the physical plane. Currently, no theoretical model based on the laws of the forward in time solution, the physical solution, can explain the feeling of existence and the qualitative aspects of the conscious experience.

In summary, when the backward-in-time solution of the equations that combine quantum mechanics with special relativity is discarded consciousness is explained as a prerequisite of reality, a creative principle of reality, on the contrary,

when the backward-in-time solution is accepted consciousness is described as a manifestation of the properties of the backward-in-time solution.

It is important to emphasize the difference between the currently widespread view according to which consciousness is the source of reality and the syntropic view according to which consciousness is a consequence of the attractive forces which act from the future. In the former case, a vision of a universe which is subject to the will and selfishness of human beings arises, whereas in the latter a converging universe that evolves towards the Omega point, the energy of love, has been envisioned by Teilhard and Fantappiè.

- The compass of the heart

The autonomic nervous system automatically and unconsciously regulates the vital functions of the body, without the need for any voluntary control.

Almost all the visceral functions are under the control of the autonomic nervous system which is divided into the sympathetic and parasympathetic systems. The nerve fibers of these systems do not directly reach the organs but stop first and form synapses with other neurons in structures called ganglia, from which other nerve fibers form systems, called plexuses, which reach the

organs. The sympathetic part of the system is close to the spinal ganglia and forms synapses together with longitudinal fibers, in a tree called the paravertebral chain. The parasympathetic system forms synapses away from the spine and closer to the organs it controls. The ganglia of the sympathetic system are distributed as follows: 3 pairs of intracranial ganglia, located along the trigeminal, 3 pairs of cervical ganglia connected to the heart; 12 pairs of dorsal ganglia connected to the lungs and the solar plexus, 4 pairs of lumbar ganglia that are connected through the solar plexus to the stomach, small intestine, liver, pancreas, and kidneys, 4 pairs of ganglia in connection with

the rectum, bladder and genital organs.

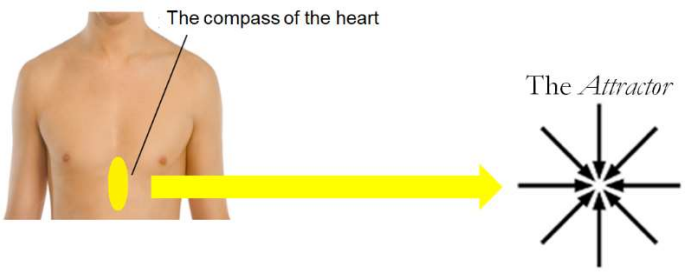
For a long time, it was believed that there was no relationship between the brain and the sympathetic system, but today we know that this relationship exists, is strong and that the brain can act directly on the organs through the mediation of the solar plexus. There is therefore a link between mental states and physical states. For example, sadness acts on the solar plexus through the sympathetic system, generating a vasoconstriction due to the contraction of the arterial system. This contraction caused by sadness hinders blood circulation, thus also affecting digestion and respiration.

People commonly refer to the heart and not to the solar plexus. However, from a physiological point of view, the organ that allows us to perceive our feelings is the solar plexus.

Syntropy nourishes the vital functions and is a converging energy that propagates from the future, consequently when the inflow of syntropy is good we feel warmth (ie energy concentration) and well-being in the thoracic area of the autonomic nervous system.

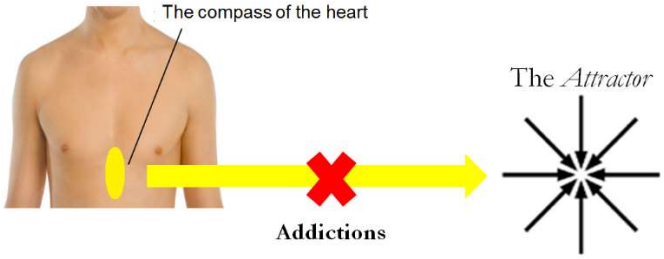
On the contrary when the inflow is insufficient, we feel emptiness, pain, and anxiety.

These feelings work like the needle of a compass which points towards the source of syntropy (ie life energy).



Unfortunately, most people are unaware of how the compass of the heart works and their main concern is to avoid suffering and the unbearable feeling of anxiety. This explains, for example, the mechanism of drug addiction. Substances that act on the autonomic nervous system, such as alcohol and heroin, causing feelings of warmth and wellbeing like those that we experience when there is a good inflow of syntropy, can soon become vital. The compass of the heart points to the source of syntropy, but drugs,

alcohol and whatever we use to sedate our suffering reduces our possibility to use the compass of the heart and chose what is beneficial for life.



To improve the flow of syntropy and promote wellbeing it is therefore essential to abandon any kind of addiction.

While the brain is made of gray matter outside and white matter inside, exactly the opposite is observed in the solar plexus. The gray matter is made up of nerve cells that allow us to think, the white matter is

made of nerve fibers, cell extensions, which allow us to feel.

The solar plexus and the brain are the opposite of each other and represent two polarities: the emitter pole and the absorber pole. The same duality that is found between entropy and syntropy.

The solar plexus and the brain are closely connected and from a phylogenetic perspective the brain has developed from the solar plexus. Between the brain and the solar plexus there is a specialization of functions that are completely different and that can only occur when these two polarities are integrated and work in harmony,

producing results that are quite extraordinary.

Experiments show that syntropy acts mainly on the solar plexus and is perceived as warmth and well-being. On the contrary, the lack of syntropy is perceived as emptiness and suffering.

Since syntropy propagates backwards in time, feelings of warmth and emptiness help us orient our choices towards advantageous goals.

The following examples provide some insights into the implications of this backward in time flow:

– The article "*In Battle, Hunches Prove to be Valuable*", published on the

front page of the New York Times on July 28, 2009, describes how experiences associated with intuitions and premonitions helped soldiers save themselves: "*My body suddenly became cold; you know, that feeling of danger, and I started screaming no-no!*" According to syntropy, the attack happens, the soldier experiences fear and death and these feelings of distress propagate backward in time. The soldier in the past feels these as premonitions and is driven to take a different decision, thus avoiding the attack and death. According to the New York Times article, these premonitions have saved more

lives than the billions of dollars spent on intelligence.

– William Cox conducted studies on the number of tickets sold in the United States for commuter trains between 1950 and 1955 and found that in the 28 cases where commuter trains had accidents, fewer tickets were sold[46]. Data analysis was repeated verifying all possible intervening variables, such as bad weather conditions, departure times, day of the week, etc. But no intervening variable was able to explain the correlation between reduced ticket sales and accidents. The reduction of

[46] Cox, W.E., *Precognition: An analysis*. Journal of the American Society for Psychical Research, 1956(50): 99-109.

passengers on trains that have accidents is strong, not only from a statistical point of view, but also from a quantitative point of view. According to syntropy, Cox's discoveries can be explained in this way: when people are involved in accidents, the feelings of pain and fear propagate backward in time and can be felt in the past in the form of presentiments and premonitions, which can lead to the decision not to travel. This propagation of feelings can therefore change the past. In other words, a negative event occurs in the future and informs us in the past, through our inner feelings. Listening to these feelings can help

us decide differently and avoid pain and suffering in our future. If we listen to the inner voice, the future can change for the better.

– Among many possible examples: on May 22, 2010, an Air India Express Boeing 737-800 flying between Dubai and Mangalore crashed during landing, killing 158 passengers, only eight survived the accident. Nine passengers, after check-in, felt sick and could not get on board.

In this regard, the neurologist Antonio Damasio, studying patients affected by decision-making deficits, discovered that feelings contribute to

the decision-making process and allow advantageous choices possible without having to make advantageous evaluations.[47]

Damasio observed that cognitive processes were added to emotional ones, maintaining the centrality of emotions in the decision-making process. This is evident in times of danger: when choices must be made quickly reason is bypassed.

People with decision making deficit show knowledge but not feelings. Their cognitive functions are intact, but not the emotional ones. They have normal intellect but are unable to make appropriate decisions. A

[47] Damasio, A.R., *Descarte's Error. Emotion, Reason, and the Human Brain*, Putnam Publishing, 1994.

dissociation between rationality and decision-making skills is observed. The alteration of feelings causes a myopia towards the future. This may be due to neurological lesions or to the use of substances, such as alcohol and heroin, which reduce the perception of our feelings.

Feelings of warmth point to the path that leads to well-being and to what is beneficial to life. It is therefore good to choose according to these feelings. When we converge towards the attractor feelings of warmth inform that we are on the right path, on the contrary when we diverge, we feel void and anxiety.

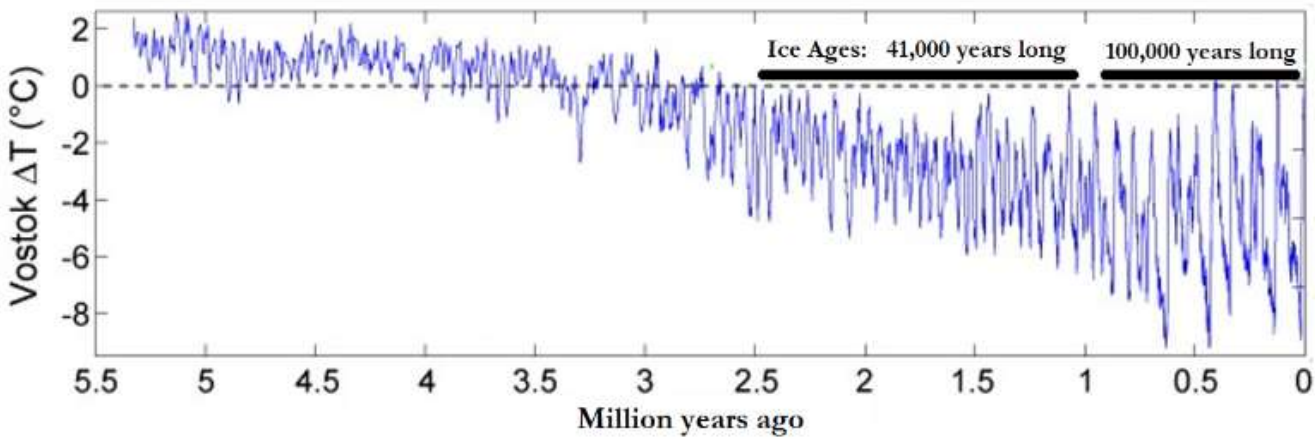
IS EXTINCTION POSSIBLE?

The syntropic vision of evolution asserts that the design and project of species is in their attractors, and even when the physical manifestation disappears the attractor remains and can readily manifest again when conditions become favorable again.

If we look at our planet from a broader view, we see continuous climate changes which have been the cause of mass extinctions.

For example, the *Quaternary*, which is the last of the three periods that make up the geological era of the *Cenozoic*, began 2,58 million years ago and it is

still ongoing. During the *Quaternary*, temperatures gradually decreased and glaciations started. Life needs water and dies with ice, since ice blocks the hydrogen bond. Glaciations have therefore always caused mass extinctions.



At the beginning of the Quaternary period glaciations lasted 41,000 years and temperatures were on average 4 degrees lower. Then they stretched beyond 100,000 years, with

temperatures on average 8 degrees lower. Short, warm interglacial periods, lasting about 10,000 years, separate each glaciation. The warm period in which we now live began 11,700 years ago.

Since ocean sediments show that we are already entering the next ice age and that temperatures will soon return glacial, in 1972 the leading geologists, gathered at Brown University, felt obliged to inform the president of the United States of America:

BROWN UNIVERSITY *Providence, Rhode Island • 02912*

DEPARTMENT OF GEOLOGICAL SCIENCES

(401) 863-2240

December 3, 1972

The President
The White House
Washington, D. C.

Dear Mr. President:

Aware of your deep concern with the future of the world, we feel obliged to inform you on the results of the scientific conference held here recently. The conference dealt with the past and future changes of climate and was attended by 42 top American and European investigators. We enclose the summary report published in Science and further publications are forthcoming in Quaternary Research.

The main conclusion of the meeting was that a global deterioration of climate, by order of magnitude larger than any hitherto experienced by civilized mankind, is a very real possibility and indeed may be due very soon. The cooling has natural cause and falls within the rank of processes which produced the last ice age. This is a surprising result based largely on recent studies of deep sea sediments.

Existing data still do not allow forecast of the precise timing of the predicted development, nor the assessment of the man's interference with the natural trends. It could not be excluded however that the cooling now under way in the Northern Hemisphere is the start of the expected shift. The present rate of the cooling seems fast enough to bring glacial temperatures in about a century, if continuing at the present pace.

The practical consequences which might be brought by such developments to existing social institutions are among others:

1) Substantially lowered food production due to the shorter growing seasons and changed rain distribution in the main grain producing belts of the world, with Eastern Europe and Central Asia to be first affected.

2) Increased frequency and amplitude of extreme weather anomalies such as those bringing floods, snowstorms, killing frosts etc.

With the efficient help of the world leaders, the research could be effectively organized and could possibly find the answers to the menace. We hope that your Administration will take decisive steps in this direction as it did with other serious international problems in the past. Meantime however it seems reasonable to prepare the agriculture and industry for possible alternatives and to form reserves.

It might also be useful for Administration to take into account that the Soviet Union, with large scientific teams monitoring the climate change in Arctic and Siberia, may already be considering these aspects in its international moves.

With best regards,

George J. Kukla
Lamont-Doherty Geological Observatory

R. K. Matthews, Chairman
Department of Geological Sciences

GJK/RKM:mc
Enclosure

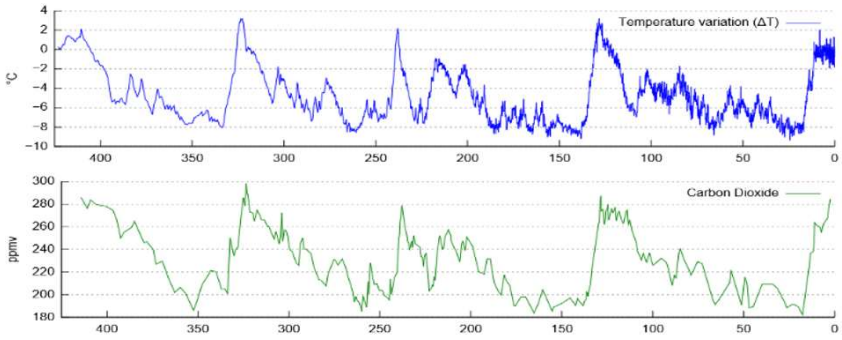
Glaciations were understood in the

18th century, when extensive observations showed that continental glaciers had covered much of Europe, North America, and Siberia.

The position and orientation of the moraines, striations, and glacial ice flow were detected and detailed maps of the extension of the ice caps, their direction and the meltwater channel systems were compiled. This allowed to decipher a story made of multiple glacial and interglacial periods.

Ice retains the same chemical properties that were present when the snow fell. In the ice cores it is possible to distinguish years similarly to the rings of a tree trunk. Air bubbles trapped in these ice rings allow to determine the variations of methane,

carbon dioxide, temperature, and dust due to volcanic eruptions.



Thousands of years ago [48,49]

Antarctica's ice cores allow to reconstruct temperatures, carbon dioxide and atmospheric composition, for the entire Quaternary period.

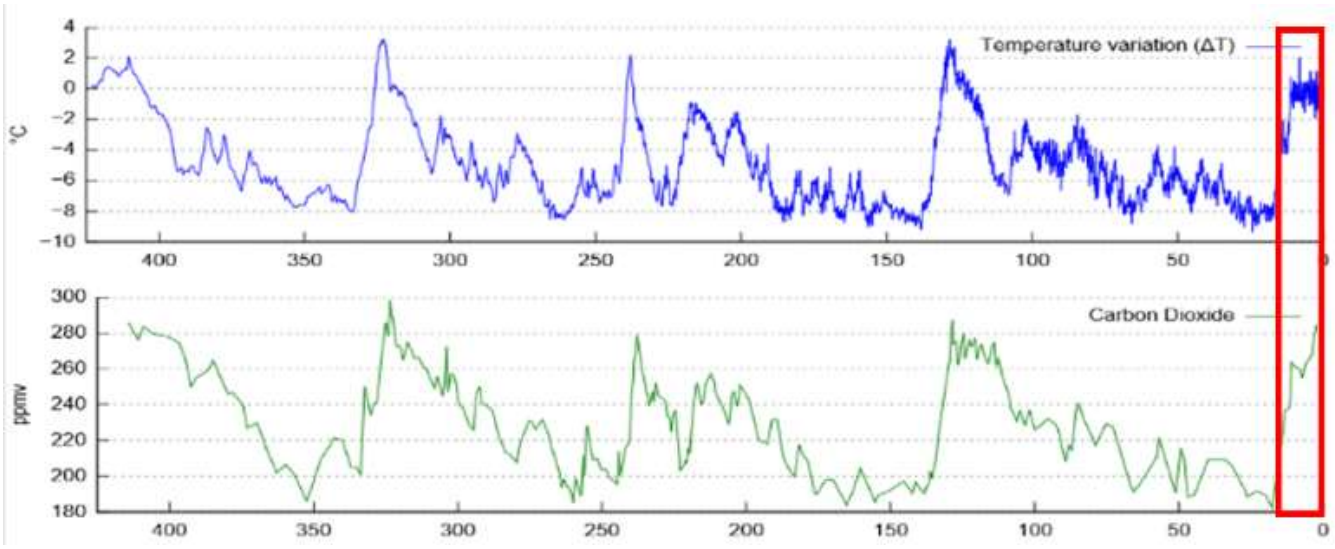
In the graph we see the trend of CO_2 and temperatures up to 400 thousand years ago. We are on the right and the more we move left, the more we go

[48] en.wikipedia.org/wiki/Ice_age#/media/File:Vostok_Petit_data.svg

[49] cdiac.ornl.gov/images/air_bubbles_historical.jpg cdiac.ornl.gov/trends/co2/ice_core_co2.html

back in time, until we reach four hundred thousand years ago.

Glaciations began 2,58 million years ago, with the cooling of the Sun which since then alternates cold and warm periods.



Each warm, interglacial period is associated with increasing temperatures and increasing levels of CO_2. Data show that temperatures rise before CO_2. This means that CO_2 is not the cause of rising

temperatures, but it is the consequence. In warm periods water becomes abundant, conditions are again favorable for life and life proliferates. Since life is based on carbon, CO_2 increases. CO_2 is a manifestation of life: fighting CO_2 means fighting life!

The scenario is quite simple! Temperatures fall during the ice age. The cooling is initially slowed by high CO_2 levels. But when life succumbs to ice, CO_2 levels decrease and the ice caps expand reaching a thickness of 4 kilometers at the points of maximum accumulation in Europe, America, and Siberia, and bringing the levels of the oceans to fall around 150 meters. At this point, life is possible only in

the equatorial belt and, more precisely, in the lands that were previously covered by the oceans.

At the end of the ice age, temperatures suddenly rise. The ice caps melt in huge interglacial lakes. The banks of these lakes suddenly break, pouring immense quantities of water into the oceans that rise tens of meters at a time. The civilizations that had survived are wiped out. Reports of these floods can be found in all cultures and date back to around 12,000 years ago. The warm period in which we are now in began 11,700 years ago.

In the 1920s Milutin Milankovitch, a Serbian geophysicist and astronomer, suggested that orbital changes could

cause periodic cooling of the Earth, with the coldest periods occurring every 41,000 years. Milankovitch believed that the Earth's orbital changes were the cause of glaciations. The orbital eccentricity of the Earth changes according to a cycle of about 100,000 years and the inclination axis varies periodically between 22 ° and 24.5° following a 41,000-year cycle. The inclination axis is responsible for the seasons, the greater the inclination, the greater the contrast between summer and winter temperatures. The precession of the equinoxes and the oscillations of the rotation axis have a periodicity of 26,000 years. Milankovitch's model explains the changes in the contrast

between the seasons, changes that are confirmed by oceanic sediments and fossils, but the overall exposure to the Sun remains the same and this does not explain glaciations. Astronomical cycles have lasted for millions of years, while the glaciations began 2,58 million years ago. Orbital changes are therefore not the cause of glaciations!

Another theory[50] argues that the reduction of CO_2, a gas that causes the greenhouse effect, has given way to long-term cooling and glaciations. But data show that the reduction of CO_2 begins after temperatures fall. CO_2 is not the cause, but the consequence.

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[50] Pagani, M. et. all., (2011), *The Role of Carbon Dioxide During the Onset of Antarctic Glaciation*, Science. 334 (6060): 1261–4.

It has recently been discovered that solar emissions are not constant, and that this variability correlates with glaciations cycles.

Solar cycles were discovered in 1843 by Samuel Heinrich Schwabe, who after 17 years of observations noted a periodic change in the average number of sunspots in a progression that follows an 11-year cycle. Scientists were perplexed by the fact that each cycle was a little different. None of the models could explain these fluctuations.

In 2015, Valentina Zharkova found that these fluctuations are caused by a double dynamo effect between two layers of the Sun, one near the surface and one deep in its convection area.

This model reconstructs past irregularities and predicts what will happen in the future.

"We found magnetic waves that appear in pairs, originating from two different layers within the Sun. Both have a cycle of about 11 years, even if they are slightly out of phase. During the cycle, the waves float between the northern and southern hemispheres of the Sun. Combining these waves and comparing them with the real data for the past solar cycles, we found that our predictions are 97% accurate."[51]

Using this model to predict the future we see that waves will become

[51] Royal Astronomical Society – *Irregular heartbeat of the Sun driven by double dynamo* https://www.ras.org.uk/news-and-press/2680-irregular-heartbeat-of-the-sun-driven-by-double-dynamo

increasingly out of phase during cycle 25, which reaches its peak in 2022. In cycle 26, which covers the decade from 2030 to 2040, waves will become totally out of phase, and this will cause a significant reduction in solar emissions.

"*In cycle 26, the two waves are opposed to each other, with their peak at the same time but in opposite hemispheres of the Sun. Their interference will be destructive and will cancel each other out ... when the waves are in phase, they can show a strong resonance, and we have strong solar activity. When they are out of phase, we have solar minima.*"

The Sun has begun to reduce its

emissions. This was last seen in the mini-ice age that took place between 1645 and 1715, a period known as the Maunder minimum when temperatures dropped globally by 1.3 degrees Celsius, leading to shorter seasons and food shortage.

Zharkova's model predicts a 60% drop in solar emissions starting from the 2030-2040 period. This reduction will interfere with the Gulf stream, the air and water current that maintains warm Northern Europe and especially Great Britain.

The sharp reduction in temperatures will increase snow and ice formations and the albedo will reflect the heat of the Sun, further reducing temperatures.

When solar emissions decrease, the magnetic shield that protects the planet weakens and cosmic rays enter the core, activating the magma and causing earthquakes and volcanic eruptions.

In the ocean floor there are more than one million volcanoes, against 15,000 on the surface. The magma emitted by submarine volcanoes increases the temperature of the oceans, and this causes extreme weather conditions, such as hurricanes and violent torrential rains.

Glaciations have created more lakes than all the other geological processes put together. The surface on which glaciers moves is eroded, leaving myriads of undrained depressions.

When the glaciation ends, these depressions fill with water and become lakes. In North America and Europe the ice cap reached 4 km in thickness and the weight lowered the Earth's crust.

When at the end of the glacial period the ice began to melt, the crust began to bounce, producing slopes and forming large basins, such as the Baltic Sea and the Great Lakes of North America. Numerous Canadian, Swedish, and Finnish lakes originated in this way.

The climatic conditions that cause glaciations influence arid and semi-arid regions. Precipitations that feed the glaciers determine the formation and development of large rain lakes

that develop in relatively arid regions, where there were no established drainage systems.

In Canada, the weight of the ice has created a vast depression around the Hudson Bay which is now below sea level. The same happened in Europe for the Baltic Sea.

With the melting of ice, the Earth's crust rebounds, causing unique earthquakes not associated with tectonic plates. The lifting of the crust occurs in two phases. The first is elastic and fast and can reach several hundred meters, the second is slow. Today the typical lifting rates are in the order of 1 cm per year or less.

Ice caps can become so heavy that they reach the bottom of the sea,

blocking the flow of water and oceanic currents.

Since the end of the last ice age, the increase in temperatures has led the sea level to rise about 130 meters. It has remained relatively stable over the last 6000 years.

Carbon dioxide (CO_2) is produced by life processes: respiration, decomposition of plants and animals, burning of wood, coal, oil, and gas, and it is necessary for trees and vegetation to grow. Together with water, CO_2 is the very essence of life! Life dies with ice and dies in the absence of CO_2!

CO_2 traps heat and this is essential to keep the planet warm. Without this invisible blanket the average

temperatures would be 18 degrees lower, and life could not exist. But data shows that CO_2 has never been enough to compensate for the drop in temperatures due to ice ages.

In the previous interglacial periods, CO_2 levels were like or higher than current levels. This indicates that in addition to natural sources of CO_2, industrial sources were also present. High levels of CO_2 indicate the existence of ancient pre-glacial industrialized civilizations. Although difficult to accept, it seems that all these civilizations were faced with extinction.

Are there traces of these civilizations?

Many archaeological discoveries remain an enigma. These are called OOPARTS (Out of Place ARTifacts). Artifacts that defy the conventional chronology or are too advanced for the level of civilization.

In the book "*The Ancient Giants Who Ruled America: The Missing Skeletons and the Great Smithsonian Cover-Up*"[52] Richard Dewhurst presents evidence of an ancient race of giants in North America and the concealment by the Smithsonian Institution.

Thousands of skeletons of giants were found, particularly in the Mississippi Valley. The book includes

[52] Dewhurst R.J., *The Ancient giants Who Ruled America: The Missing Skeletons and the Great –Smithsonian Cover-Up*
https://www.amazon.com/gp/product/1591431719

more than 100 photographs and illustrations and shows that the Smithsonian Institution came, took the skeletons for further study, and then made them disappear.

In some cases, other government institutions were involved. But the result was always the same: skeletons were removed and disappeared forever.

Why?

OOPARTS and pre-glacial civilizations contradict the narrative that we are the first civilization on this planet and contradict the narrative of evolution by chance and fight for survival on which our socio-

economic system is based on. They instead show that life is driven by attractors, towards unity and cooperation and that extinction does not exists, since attractors continue and will manifest again when the physical conditions are again favorable.

SOCIAL DARWINISM

Thomas Robert Malthus (1766-1834) in *An Essay on the Principle of Population*[53], published in 1798, stated that every twenty-five years the population grows according to a geometrical ratio (1, 2, 4, 8, 16, 32, 64, 128, 256 ...), while the amount of food available grows according to an arithmetical ratio (1, 2, 3, 4, 5, 6, 7, 8, 9 ...); therefore, while the population doubles, food resources show a much more modest increase. Consequently, Malthus predicted that in 300 years,

[53] Malthus T.R. 1798, *An Essay on the principle of population as it affects the future improvement of society*, Reprint, London: Reeves and Turner, 1878.

the proportion between population and food resources would be 4,096 to 13 and food resources would not be sufficient for the needs of the population.

Malthus believed that, to stop this rapid growth of population, famine and disease were needed and were the two main instruments of population control. Hunger, epidemics, wars, but also the extermination of babies would contribute to control the population, thus balancing the population and the food. Malthus proposed measures to be adopted regarding the less affluent people to avoid their reproduction. These measures were adopted in England and translated into laws, such as

“homes” for the poor where it was forbidden for married couples to conceive, to reduce the growth of the poorer inhabitants.

After the French Revolution, the English aristocracy feared losing their privileges and having to give up their status and power to the working classes. Malthus’s ideas became popular and spread the belief that future societies could consist of a conspicuous presence of rich.

This vision required that the poor and needy had to be eliminated and oppressed.

Malthus asserted that:

"Instead of recommending cleanliness to the poor, we should encourage contrary habits. In our towns we should make the streets narrower, crowd more people into the houses, and court the return of the plague. In the country, we should build our villages near stagnant pools, and particularly encourage settlements in all marshy and unwholesome situations. But above all, we should reprobate (strongly condemn) specific remedies for ravaging diseases; and those benevolent, but much mistaken men, who have thought they were doing a service to mankind by projecting schemes for the total extirpation of particular disorders."

Aristocrats believed it was necessary to oppress and exploit the lower class

and Malthus provided a "scientific" theory which justified this policy:

"We are bound in justice and honor formally to disclaim the right of the poor to support. To this end, I should propose a regulation to be made, declaring, that no child born... should ever be entitled to parish assistance... The (illegitimate) infant is, comparatively speaking, of little value to the society, as others will immediately supply its place... All the children born, beyond what would be required to keep up the population to this (desired) level, must necessarily perish, unless room be made for them by the deaths of grown persons."

Malthus's views were translated into oppressive laws, which worsened the already critical conditions of the poor.

In 1851, Herbert Spencer (1820-1903) a British sociologist and philosopher, inspired by the theses of Malthus, proposed in the book *Social Statistic* the idea of the "*struggle for survival*". Spencer argued that history is not made by the free choices of men, but by the laws of biology, which allocates everyone to a specific occupation and position in society. Positions are assigned to each of us by nature, at birth, with inevitable inequalities and antagonisms. One of the socio-political implications of Spencer's view is that reality cannot be changed by individuals, and it is

useless and wrong to waste time trying to change it. Individuals must accept what they have. Spencer also formulated the concept of "*survival of the fittest*" and declared that the "*unfit*" should be eliminated:

> *"If they are sufficiently complete to live, they do live, and it is well they should live. If they are not sufficiently complete to live, they die, and it is best they should die."*[54]

In Spencer's opinion, the poor, the uneducated, sick, crippled and unsuccessful had to die and in this view, he opposed the British laws which gave protection to the poor,

[54] Spencer H 1851, *Social Statics*, Chapman, London.

provided education, aid, health and housing.

In his autobiography Charles Darwin wrote:

"In October 1838, that is fifteen months after I had begun my systematic enquiry, I happened to read for amusement Malthus on Population, and being well prepared to appreciate the struggle for existence that everywhere goes on from long-continued observation of the habits of animals and plants, it at once struck me that under these circumstances, favorable variations would tend to be preserved and unfavorable ones to be destroyed. The result of this would be the formation of new species. Here, then, I had at last got a theory by which to work."[55]

[55] de Beer G 1963, *Charles Darwin*, London: Thomas Nelson & Sons.

The concepts of evolution by natural selection and struggle for survival took shape in Darwin's mind after reading the works of Malthus and Spencer.

In *The Origin of Species*[56] Darwin admitted that he had fully accepted the ideas of Malthus:

"There is no exception to the rule that every organic being naturally increases at so high a rate, that, if not destroyed, the Earth would soon be covered by the progeny of a single pair. Even slow-breeding man has doubled in twenty-five years, and at this rate, in less than a thousand years, there

[56] Darwin C 1859, *On the Origin of Species by Means of Natural Selection*, London, 2nd edition 1964, Cambridge: Harvard University Press.

would literally not be standing-room for his progeny."

Darwin described Malthus's theory of natural selection in the following way:

"As more individuals are produced than can possibly survive, there must in every case be a struggle for existence, either one individual with another of the same species, or with the individuals of distinct species, or with the physical conditions of life. It is the doctrine of Malthus applied with manifold force to the whole animal and vegetable kingdoms."

Darwin gave to Malthus and Spencer's views the scientific validation which allowed to translate

them in a social doctrine. This doctrine is named *Social Darwinism*, a doctrine which considers wars of conquest an application, to the human species, of the law of natural selection. According to Social Darwinism there is a biological reason for disparities: less fit individuals and nations must remain relegated to the primitive stage. This ideology supported colonialism, eugenics, fascism, and savage capitalism:

– *Colonialism*. The doctrine of Social Darwinism was used to justify the exploitation of native populations. It was legitimate, a law of nature, that the superior races could

oppress inferior races. Wars became unavoidable ways to ensure human progress, similarly to the elimination of innocents and poor, the destruction of their homes, businesses, and livestock, the forcing of millions away from their homes and land, the murder of infants and children.

– *Eugenics*. Formulated by Darwin's cousin, Francis Galton, eugenics assumed that it is necessary to select higher-quality individuals through a process of elimination of poor genes. On this idea was based the extermination of Jews, Gypsies and Eastern Europeans, which were regarded as inferior races.

Mentally ill, the disabled and elderly were murdered. Galton believed that human development could be accelerated and maintained that human selection was the way. Thus, compulsory sterilization or extermination of those considered "unnecessary" or less than human was inflicted.

– *Nazism*. The cruelest application of eugenics occurred during the Nazi rule of Germany. The crippled, mentally ill and people with hereditary diseases were initially sterilized and then disposed of; people were sentenced to death just for being old or mutilated. Social Darwinism became the rule in Nazi

Germany. The clash between the young German nation, full of vitality, and the old nations, such as France, was considered an inevitable example of the law of natural selection and a sufficient justification for war. The vitality of Germany was deduced almost exclusively from its growing population. Russia and the Slavic countries also had a fast-growing population and were considered dangerous, since this rise in population would inevitably lead to a violent conflict. The Nazis justified the oppression of the weak, the poor and the "inferior" races, the elimination of the disabled, the subjugation of small

businesses, as a natural law, the only way to advance humanity. They tried to justify all these injustices based on "science". The lack of compassion was depicted as a law of nature and necessary for evolution.

Andrew Carnegie (1835-1919) in a speech in 1889 said:

"The price society pays for the law of competition, as well as the price it pays for cheap comforts and luxury goods, is high, but the benefits of this law are greater than its cost - and it is to this law that we owe our wonderful material development, which brings improved conditions. While this law for individuals may be hard, for the race it

insures the survival of the fittest in every department. We accept and welcome, therefore, great inequalities, the concentration of business, industrial and commercial, in the hands of a few, and the law of competition between these, is not only beneficial, but essential for the future progress of the race."

According to Social Darwinism the sole objective is physical and economic growth and evolution of the race. Happiness, well-being, peace, and security appear to have no importance.

No compassion is felt towards those who suffer and cry for help, for those who cannot provide for their children, for elderly parents and

families without shelter, food, and medicine, for the poor and powerless.

According to this vision a poor but honest citizen has no value, and his death will benefit the race. But someone rich but morally corrupt is regarded important for the "progress of the race".

This logic has led to the collapse of moral and ethical values. When a society undergoes moral degeneration, the liberal economy turns into *savage capitalism* in which the poor and oppressed and the marginalized do not receive any aid, assistance, or social justice. Injustice is not seen as a problem but as part of a natural law. Savage capitalism does not protect weaker firms (and weaker

individuals) against the risk of being subdued, exploited, and eliminated. This philosophy is summed up in the saying "*the big fish eats the smaller one*" where small businesses are acquired by larger ones.

Social Darwinism provided a scientific basis for savage capitalism, and savage capitalism still governs the global economy.

The United States of America was the first country to apply Social Darwinian in business practices and economy. This system, camouflaged under the name "capitalism", was based on the idea of the "survival of the fittest". The result was the beginning of a fierce competition in business which even culminated in

murder, which was considered a legitimate act guided by the laws of nature.

Recent financial and corporate scandals recall the period of the late nineteenth century, which was marked by social and economic dictatorship, now named the "*robber barons*". This name was given to the unscrupulous and despotic nobility of the medieval period in Europe and in the modern US is used to describe unscrupulous industrialists.

During the late nineteenth century, the ideology of Social Darwinism controlled the President, Congress, the Supreme Court and the two major parties, and was used to brutally quell social unrest. The only goal was to get

more money and increase power. The robber barons had no interest in social welfare, even that of their own workers. Millions of lives were ruined by extremely low wages, by the upheaval of working conditions and long working hours. The lack of security precautions meant that workers fell ill, were wounded, and often killed.

Industrialists did not pay importance to the value of human life (especially that of their workers) ignoring any form of safety precaution and causing the multiplication of incidents in the workplace. Many workers died and in the early twentieth century, only in the United States, over one million workers each year were victim of

accidents. For workers who spent their lives in the factory, the loss of a limb was almost inevitable. During the working life, more than half of workers were badly mutilated or lost their sight or hearing. Although the industrialists were aware of these working conditions and incidents, they did not take any measures since they did not give any value to human life.

Carnegie thought that competition was an inevitable biological law, and, on this conviction, he based his philosophy.

He stated that:

"Despite the law of competition complicates the situation for some, it is good for the race because it ensures the survival of the fittest in every department."

Carnegie discovered Social Darwinism in the house of a professor at New York University where he met Herbert Spencer:

"Competition makes business a service to society by eliminating the weaker elements. Those who survive in business are "suitable" and therefore deserve the position and the rewards they have."

Social Darwinism became the dominant economic ideology. As John Rockefeller said:

"The growth of a large company is simply the survival of the fittest (...) the result of a law of nature."[57]

Considering that only the rich and powerful had the right to live and the poor, the weak and the sick were "useless burdens", the "robber barons" created ruthless competition using oppressive systems which justified exploitation, intimidation, harassment and even death. These systems were not condemned or considered immoral or illegal since they were a direct consequence of the laws of nature.

[57] Ghent W 1902 , *Our Benevolent Feudalism*, New York: Macmillan.

In a letter to Charles Kingsley, Darwin described the natives of Tierra del Fuego:

"I declare the thought, when I first saw in Tierra del Fuego a naked, painted, shivering, hideous savage, that my ancestors must have been somewhat similar beings, was at that time as revolting to me, nay more revolting, than my present belief that an incomparably more remote ancestor was a hairy beast. Monkeys have downright good hearts."

In *The Descent of Man*, Darwin claimed that some races (blacks and aboriginals), were inferior and that, in due course, would be eliminated and

would disappear in the struggle for survival:

> *"At some future period not very distant as measured by centuries, the civilized races of man will almost certainly exterminate, and replace the savage races throughout the world. At the same time the anthropomorphous apes… will no doubt be exterminated. The break between man and his nearest allies will then be wider, for it will intervene between man in a more civilized state, as we may hope, even than the Caucasian, and some ape as low as the baboon, instead of as now between the negro or Australian and the gorilla."*

Darwin predicted that "*civilized races of man*" would eliminate "*savage races*"

from the face of the Earth. In *The Origin of Species*, Darwin's theory of evolution provided "scientific" basis for ethnic cleansing that was carried out within a few years. Based on Darwin's theories, Europeans massacred more than 40 million people during World War II, justified apartheid, racism against Turks and other foreigners in Europe, against blacks in America, in Australia against Aborigines, and gave the start to neo-Nazi movements in various countries.

In Darwin's doctrine which considers life a product of chance without any purpose and value, love is alien. The British Eugenics Society, founded by Darwin's cousin, Francis

Galton, his son George, and Aldous and Julian, sons of his great friend Thomas Huxley, based their vision on assumption which disregarded any reference to love, cooperation, and unity. In *The Descent of Man* Darwin states that:

> *'We civilized men … do our utmost to check the process of elimination. We build asylums for the imbecile, the maimed and the sick; we institute poor laws; and our medical men exert their utmost skill to save the life of everyone to the last moment. There is reason to believe that vaccination has preserved thousands, who from a weak constitution would formerly have succumbed to smallpox. Thus, the weak members of civilized societies propagate their kind. No*

one who has attended to the breeding of domestic animals will doubt that this must be highly injurious to the race of man. It is surprising how soon a want of care, or care wrongly directed, leads to the degeneration of a domestic race; but excepting in the case of man himself, hardly anyone is so ignorant as to allow his worst animals to breed."

FINAL CONSIDERATIONS

This is how Luigi Fantappiè described his Unitary Theory in a letter to a friend:

"It was in the days just before Christmas 1941, because of conversations with two colleagues, a physicist and a biologist, that I was suddenly projected in a new panorama, which radically changed the vision of science and of the Universe which I had inherited from my teachers, and which I had always considered the strong and certain ground on which to base my scientific investigations.

Suddenly I saw the possibility of interpreting a wide range of solutions, the

advanced potentials of the wave equation which can be considered the fundamental law of the Universe. These solutions had been always rejected as impossible, but suddenly they appeared possible, and they explained a new category of phenomena which I later named syntropic, totally different from the mechanical, physical and chemical laws, which obey only the principle of causation and the law of entropy.

Syntropic phenomena, which are represented by those strange solutions of the advanced potentials, obey two opposite principles of finality and differentiation and they are not causable in a laboratory.

Its finalistic properties justify the refusal among scientists, who accepted without any doubt the assumption that finalism is a metaphysical principle, outside Science and

Nature. This assumption obstructed the way to a calm investigation of the real existence of this second type of phenomena; an investigation which I accepted to carry out, even though I felt as if I were falling in an abyss, with incredible consequences and conclusions.

It suddenly seemed as if the sky were falling apart, or at least the certainties on which mechanical science had based its assumptions. It appeared clear to me that these "syntropic", finalistic phenomena which lead to differentiation and could not be reproduced in a laboratory, were real, and existed in nature, as I could recognize them in the living systems.

The properties of syntropy opened consequences which were just incredible, and which could deeply change the biological,

medical, psychological, and social sciences."

The signs of a new supercausal paradigm, which considers also the invisible and retrocausal properties of syntropy, can be seen a bit everywhere, but we are just at the beginning and there will be a lot of work to be done.