

JOSÉ DíEZ FAIXAT

# **BEYOND DARWIN**

## **THE HIDDEN RHYTHM OF EVOLUTION**

TRANSLATION: RAQUEL TORRENT  
EDITING: PAUL BARNES

TO

SRI AUROBINDO  
PIERRE TEILHARD DE CHARDIN  
ERVIN LASZLO  
KEN WILBER

## Abstract

This article surprisingly reveals the existence of a very precise spiral rhythm in the emergence of the evolutionary leaps that mark the history of the universe.

The proposed hypothesis is very simple: just as in any musical instrument successive second harmonics ( $1/3$  of the vibrating unit) progressively generate new sounds; these same second harmonics generate all the major evolutionary novelties in universal dynamics as a whole. It is truly surprising that such a simple proposal is found to be precise and categorical when cross-checked against historical data. Let us see.

Fitting our ‘periodic table’ of rhythms to the date of the appearance of matter –the Big Bang– and of organic life, we see that every single instant of the emergence of successive taxonomic degrees of human phylogeny is marked out with utter precision: **Kingdom: animal, Phylum: chordata, Class: mammal, Order: primate, Superfamily: hominoid, Family: hominid and Genus: homo!** The same then occurs with all the stages of maturation of our primitive ancestors: **H. habilis, H. erectus, archaic H. sapiens, H. sapiens and H. sapiens sapiens!** Once more, the precision of our hypothesis is repeated in the successive transformations that humanity has experienced in its more recent history: **the Neolithic, Antiquity, the Middle Ages, the Modern Age and the emergent Postmodern Age!** If, as we see it, all these stages resoundingly fit the provisions of the ‘periodic table’ of rhythms that we have proposed, it is more than likely that our hypothesis may also provide the key to glimpse the successive phases yet to be deployed in the years to come in an ever-accelerating process that will eventually lead to a moment of infinite creativity –Omega– within a couple of centuries.

All this is, indeed, unexpected and surprising, but is now almost certain when we verify that the same hypothesis that has behaved with utter precision when applied to the process of global evolution, also does so when cross-checked against the process of development of the individual human being! Within the same time frame, with the same pattern of folding and unfolding, and passing through the same stages, our ‘periodic table’ of rhythms periodically marks out –step by step– the successive phases embryologists, developmental psychologists and spiritual teachers talk of, thus confirming the old idea of phylogenetic-ontogenetic parallelism and pointing very specifically to an astonishing fractal and holographic universe.

It is impossible, absolutely impossible, that all this accumulation of linked “coincidences” –in both the field of overall development and that of individual human development– highlighted in this paper is the product of mere chance. The conclusions that emerge from all this clash head on with many assumptions of predominant materialistic science. Our proposal, which provides a better fit to the presented data, points to the non-duality of energy and consciousness, as posed by many traditions of wisdom. From these pages, we invite all our readers to participate in this emerging experiential and theoretical research in which dazzling prospects can be glimpsed.

## **Introduction**

Hi everyone!

For many years, I have been intrigued by the fascinating creativity of the universe, in its material, biological and mental aspects. More than forty years ago, I tried to find an answer to the surprising evolutionary phenomenon, passionately investigating within the diverse branches of Western science and simultaneously in the rich existential research of the Eastern traditions of wisdom. Suddenly, unexpectedly, all that research crystallized in January 1981 in a very precise hypothesis about the rate of the evolution.

On collating this hypothesis –which in principle seemed to be a simple, ingenious and daring insight that had fall out of the blue– with empirical data from different spheres of reality (paleontological, anthropological, historical, embryological, psychological, etc.) and verifying its surprising validity and precision, over the years it has been become a solid scientific (falsifiable) proposal that shows an unexpected periodic pattern in the emergence of evolutionary novelties and that hence clashes head-on with the still prevailing view of how the world works.

As this paper has been written single-handedly during this time, with no other company than hundreds of books, and given the breadth and scope of the proposal, it seems advisable to open this hypothesis regarding “the hidden rate of evolution” to public criticism so that those interested can carry out their own inquiries with a view to testing its validity and, if need be, make any adjustments they deem necessary. You are cordially invited to do so!”

To start off, to set the scene, I will outline the general scenario within which we will develop our proposal. Things are changing.

## **A new universe**

During recent decades, the apparently solid view of the mechanistic and materialistic world has started to show alarming cracks. Approaches that a century ago were taken as rigorous and almost irrefutable are starting to be seriously questioned.

These approaches postulated that the universe is moved by a simple game of chance, in progressive degradation and inexorably tending toward thermal death. In major contrast with these dark auguries, new science views –beset with surprise– a fascinating creativity in all spheres of reality. An unstoppable evolutionary current runs through entire history of the cosmos, one that generates all types of novelties. The supposed universal machine, virtually condemned to the scrapyard, is now revealed as a rare living being animated by a self-creative permanent force. It seems that Nature starts to reveal the secrets of its holistic inner tendency, one which drives it to climb the ladder of organized complexity. This ascending drive has been creating progressively differentiated, integrated and inclusive units step by step.

Mechanistic Science harbored the reductionist dream of explaining the functioning of complex structures starting out, exclusively, from its most basic components. New science has forsaken that dream on verifying repeatedly and in diverse levels of reality

that the whole is greater than the sum of the parts. The flow of evolution engenders novelties which, though logically compatible with precedent structures, cannot however be explained by them. There is thus a dynamic, hierarchical schema of the world in which emerging levels are integrated with previous ones, thereby generating more complex, inclusive organisms with increasing awareness. Elemental particles form part of atoms, atoms part of molecules, molecules part of cells, cells part of organisms and so on. The universe thus reveals itself as a hierarchy that extends unlimitedly upward and downwards throughout the course of evolution.

On the other hand, each one of these levels of universal reality is structured by an infinite reciprocal interplay among individuals and communities. Some and many are involved like reflections in a grid of mirrors facing one another. An individual devoid of an environment is not possible, neither is a group without the individuals that compose it. We cannot separate off isolated unities in these universal networks of interrelationships and interconnections. As Quantum Physics has demonstrated, the scope of these complex webs of relations goes beyond what is humanly conceivable, even transcending our time and space schemata. There are no actually separated “parts” in any level of the evolutionary scale. On the contrary, as in a holographic plate, each “fragment” of the world is no more than a concrete expression of the same, unique totality. The universe starts to reveal itself to the eyes of new science as a unified field that is dynamically reflected in each and every corner of itself.

Attempts were made to build the world upon the solid and strong foundations of matter, but this myth has not stood up to empirical testing. Subatomic analysis has literally taken the floor away from under our feet. Our supposedly indestructible material basis has dissolved in pure forms, patterns, orders and relationships in a fabric that is no longer substantial, but purely abstract instead. We are supported by evanescent forms that vertiginously emerge and disappear in an intangible void. Within the scientific community, it has even been asserted that the universe is beginning to look more like a great thought than a great machine.

The materialistic focus of classical science also aimed to describe the world “objectively”, placing the “subject” making the description on the sidelines. However, the emergent postmodern perspective has once more revealed the complete ingenuity of this project. The observing mind is inevitably part of the observed universe. There is not object without subject, no outside without inside, no reality without consciousness. Both terms are definitively interrelated and therefore any attempt to comprehend the phenomenal world integrally must necessarily include both facets. The dynamics of evolution is thus perceived as a generator of entities, not only progressively more organized and complex in their external appearance, but also, at the same time, of greater inner awareness. We cannot limit our vision solely to the surface of things, because, although we try to ignore them, the depths of lucidity will finally become patent to us over and over again.

The universe that surprisingly begins to reveal itself before our gaze has little to do with that blind, insensitive artifact, that mechanical and inert world in which the human being imagining it, did not even have a place in it. The new approaches that study reality no longer consider us aberrant creatures in a world without sense, but rather as redolent expressions of the creative flow of totality, authentic microcosms that reflect with increasing clarity, the infinite richness of a fascinating macrocosm.

Our research on the rhythm of evolution falls within this new perspective of a universe that is self-creating—a generator of progressively more complex and organized novelties,—, hierarchical—in which each new level transcends and becomes integrated with all previous levels,—, holographic—in which each part reflects the totality,—, impermanent—in a continuous dance of creation and destruction,—, lucid—capable of knowing itself,—, and void—without a basic substance that supports it.

In this new emerging outlook, our daring proposal that a harmonious pattern that governs the rhythm of evolution exists no longer sounds so shocking. Let us see.

### **The crisis of Darwinism**

Nowadays science agrees that evolution is a core feature of the universe. There is a complete consensus regarding the dynamic and creative features of phenomenal reality in all fields of human knowledge—astrophysics, biology, psychology, sociology, and others—. Nevertheless, there are discrepancies in the interpretation of the facts.

Darwin's theory of evolution was primarily based on random mutations and the "survival of the fittest". The "synthetic theory" extended these formulations in the late 1930s and early 40s with the contributions of Mendelian genetics and population-based genetics, maintaining as explanatory basic elements the aforementioned random mutation and natural selection. This synthetic theory enjoyed almost unanimous acceptance for two or three decades, but gave rise to a great wave of dissent from 1970 on. The idea that the synthetic theory is wrong is beginning to take shape for many paleontologists, geneticists, embryologists and taxonomists, who refute the random factor as the sole principle governing the evolutionary process. They disagree that natural selection explains the emergence of new species. They affirm that fossil records do not fit Darwinian gradualism and denounce that the theory does not reflect the phenomenon of increasing complexity.

Biologists find it very difficult to understand how a fundamentally random search among an extremely high number of possibilities could result in the emergence of living beings with their evident level of complexity. As we understand it today, evolution cannot be conceived as having random variations as its sole material. Organisms vary as a whole; huge numbers of mutations would hence be required to occur simultaneously, in the appropriate way, when their "need" arose and with a close links among them... How could all this be fulfilled by chance? The same could be said of the formation of any of the complex organs, for example, the internal ear or the brain. A classic problem has been the difficulty in explaining intermediate forms in the development of complex adaptations, as in the case of the eyes. Darwin himself confessed that it was absurd to imagine that the eye could have evolved by natural selection.

Darwin's original idea about new species emerging gradually at the initiative of natural selection along the course of time is currently being questioned. The simple principle of natural selection seems inadequate to understand and predict all evolutionary processes. Spontaneous mutations may explain variations within a certain species, but not the subsequent variations among them.

Long before Mendel's laws were known, many varieties of plants and breeds of domestic animals were already being developed by means of selective breeding. There is no reason to doubt that a similar development of breeds and varieties may arise in Nature under the influence of natural selection instead of artificial selection. The mechanisms of microevolution —small evolutionary changes consisting in minor disturbances in genetic proportions, the number of chromosomes or chromosomal abnormalities— may be explained by the Neodarwinian theory as a function of random mutations, Mendelian genetics and natural selection. However, this mechanistic scheme, which may be valid at a small scale —in a given species—, encounters countless problems when trying to explain the origin of new species —known as “speciation”— and even greater difficulties when faced with the emergence of genus, families or higher taxonomic divisions. Macroevolution or typogenesis —the evolution of these higher-order taxonomic categories— show far too pronounced differences among divisions to have arisen from gradual transformations. The conclusion seems to be that the laws that govern large-scale processes —such as the origin of new types or the extinction of species— are different to those ruling the simple processes of adaptation to the environment. Thus, the reductionist expectations of “macro” scale processes being immediately inferable from the “micro” scale are fully refuted. In the words of C.H. Waddington: “one of the most fundamental problems of the Theory of Evolution is that of understanding how the evident discontinuities found among the main taxonomic ranks: *phylum*, family, species, et cetera, have emerged”.

The growing sensation prevails that it is no longer possible to explain speciation simply by natural selection. Some have even asserted that natural selection does not in fact have anything to do with the emergence of new species. In recent years, the gradualist conception of evolution has been seen to be responsible for only a small part of evolutionary change. Furthermore, deepest changes in the biological evolution have been seen to take place in specific moments of the history of groups, occurring in a very rapid manner and giving rise to stable species that suffer very few subsequent variations.

Fossil records mainly consist in thick layers of earth in which some species are evenly distributed, separated by thin surfaces through which species suddenly change in a process of multiple speciation. Many paleontologists think that this intermittent history shown by fossils should not be attributed to simple gaps in the record, but that it basically demonstrates the rhythm with which life has evolved. Therefore, many of them have started to dispute the classical conception of the *tempo* of evolution. The Darwinian version of a slow, continuous and gradual process has given way to the interpretation characterized by discontinuous, sudden leaps and changes. There is hence an evident renaissance of the idea of vigorous, sudden and energetic speciation, versus calm gradation, strongly giving rise to the perception that fossil records contain much more information than what might be imagined via natural selection alone. This is due to the emergence of non-predictable patterns thanks to our present knowledge about small-scale populations and processes.

In 1972, S. J. Gould and N. Eldredge published a seminal paper in which they demonstrated that nature progresses by sudden leaps and profound transformations and not through small adaptations. According to the theory of punctuated equilibria, evolutionary leaps are relatively sudden processes; speciation stops for long periods in which existing species persist without fundamental variations and without creating new

species (stasis). While a species persists, it remains relatively invariable; its legacy of genetic information is transmitted without major changes to the following generations. At some point, however, this stasis is suddenly broken and an evolutionary leap forward takes place. As Gould puts it, “the history of any one part of the earth, like the life of a soldier, consists of long periods of boredom and short periods of terror”.

However, synthetic theory has difficulties in explaining not only the sudden changes in species, but also the long periods of stasis. Therefore, some researchers have begun to seek possible explanations for the sudden emergences of new species —analyzing changes in the rhythm of embryonic processes that may produce major effects in adult organisms— as well as the surprising stages of stasis —studying the possibility that the genetic or biological development of organisms may permit no more than the monitoring of certain morphological routes. In that case, once the species has found a good solution to environmental problems, it will adhere to it by means of numerous changes and secondary genetic disturbances, not changing again until it has achieved a suitable stable solution for the future.

Specialists in macroevolution make other provocative observations about fossil records that are difficult to explain from simple Neodarwinian postulates. For example, the fact that the simpler an organism is, the longer its period of permanence period, or the fact that complete diversity seems to be closer to a stationary state (or stasis), i.e. the tree of life has stopped sprouting branches and has reached a certain equilibrium, or the ever present puzzle that practically all of the animal phyla—types of animals— have emerged precisely among the earliest remains of the Cambrian explosion, 530 million years ago, or the evident growth in complexity of organisms throughout evolution.

### **Oriented evolution**

Classical science tried to explain the novel events of evolution as mere products of whimsical chance, happenstances that go against the tide in an absurd universe fatally doomed to total chaos. It was said that the emergence of life and mind was only a virtually impossible, odd anecdote in a world of inert and inanimate material.

It is also curious how a theory such as that of natural selection, which aims to clarify the origin of the species, offers no explanation —as Darwin himself admitted on several occasions— for the phenomena of the increase in complexity, which is the essential feature of evolution. According to J. Maynard Smith —one of the main theorists of Evolutionism—: “There is nothing in Neodarwinism which enables us to predict a long-term increase in complexity”. In other words, natural selection does not imply any directionality in time. Moreover, observing the overall picture of evolution, we can perceive a characteristic arrow in the process with pristine clarity: over time, living beings have mostly proceeded from a simple structure to a more complex one, their psyche and their autonomy increasing in parallel to this process. Paleontological documents clearly reveal the major currents of increasing complexity in structures and relational functions, as well as the simultaneous advancement of the capacity of such organisms to capture and process information from the environment. All this has led many researchers to propose alternative or complementary theories that attempt to explain the observed phenomena.

As previously stated, science is starting to understand that, simultaneous to the process of growth in homogeneity and positive entropy—chaos—perceived in the universe, the reverse phenomena occurs with the same naturalness, i.e. the progressive increase in heterogeneity and negative entropy. The latter is a mathematical counterpart of the concept of information which may be considered as a new measure for order and organization. Contrary to classic thermodynamics, which aimed to reduce the processes of self-organization to mere accidental events, to simple insignificant anecdotes, today's thermodynamics of disequilibrium allows us to understand the progressive and accelerated evolution of living beings and our own human history as something more than mere strange accidents in cosmic evolution.

Up until the 1970s, researches tended to hold the conception —presented in the most expressive way by Jacques Monod— that evolution acts mainly due to causal factors. In the 1980s, however, many scientists started to be convinced that evolution is not an accident, but a necessary event that occurs when certain parametrical conditions are fulfilled. Laboratory experiments and quantitative formulations confirm the non-accidental character of the evolutionary processes. It is beginning to be evident that the continuous deployment of the organized complexity of the universe, its intrinsic sporadic capacity for sporadic self-organization constitutes a fundamental and profoundly mysterious property of reality. A new and fascinating paradigm is beginning to emerge, that of a creative universe, one that recognizes the surprisingly innovative and progressive nature of universal dynamics. There is much talk of the crazy organizing frenzy of matter, of the animated evolutionary ghost that starts to appear in our worldview, of the strange self-organizing capacity of nature, of its mysterious tendency to ascend the steps of complexity, those of the autopoietic dynamics —self-creation— of the whole universe.

The new sciences of evolution thus perceive a new harmonious and natural coherence throughout the creative universal process from the mere originating instant. They deny that the random factor is the only explicative argument of novel phenomena and they claim that the old theory does not explain the surprising emergence of increasing complexity at all. On the contrary, they advocate the non-accidental character of evolutionary processes and provide numerous proofs that all dynamical systems, at different levels of reality, develop similar creative patterns. The new approaches show how any dynamic system far from a state of equilibrium may leave its permanent state when some of its environmental parameters change. In these situations, systems may spontaneously reach new states of equilibrium of greater complexity subsequent to a chaotic and indeterminate phase. The overall course of evolution thus looks like stairs in which horizontal steps alternate, almost without changes, with abrupt leaps in level.

Both within theoretical or empirical works and in hard or soft sciences, the aim is to understand the innate creative tendency of nature; the surprising patterns of organization in which the game of chance is channeled. We hear about: dynamic attractors, morphogenetic fields, archetypal channels, implied orders, fractal structures —self-similar—, and also stratified stabilities. It now seems evident that creativity cannot be reduced to a mere random product, but rather to the holistic intervention of unified fields that may explain both the overall totality of creative phenomena and their quality of instantaneity. The implacable integrity of these fields would also explain their capacity to organize diverse and independent elements in a harmonious way by means of a unique momentum.



Our hypothesis about the rhythm of evolution contributes novel features to this research and may also offer a line of work full of pleasant surprises.

### **A harmonious solution**

We were saying that the supposed solidity of matter, upon which the world was supposedly raised, has faded away before the gaze of New Science into pure forms and relationships within an abstract, insubstantial fabric. Thus, the ancient dispute between several Greeks schools arises once again in our time. While for Ionic philosophers the most important issue consisted in discovering the corporeal substance of the world, for the Platonic and Pythagorean schools the key was to be found in patterns and orders. The science of today essentially moves along this second line of thought.

The most fundamental statement of the Pythagoreans was that numbers constitute the unmovable principle of the world; the very essence of reality. When they discovered that the proportions among musical harmonics could be expressed in a simple and exact form, they considered that the cosmos itself was a harmonious system of numerical reasoning: all reality could be expressed by means of relationships among numbers. According to the Pythagorean's, the inherent numerical order of sounds was directly related with the very organization of the universe. For them, music was therefore nothing other than the expression of the inner relationships of the cosmos. They even affirmed that all material manifestation was the result of the concert of universal vibrations.

At the beginning of 20th century, physicists were confused on discovering that, far from presenting itself as predicted as a continuous flow, the energy emitted or absorbed by atoms presents itself in a quantifiable way, in very precise packages,. For several decades, they tried to explain this strange phenomenon by seeking a sound new mathematical theory for the atom that would generate these quantum numbers in a natural way. The solution arrived with the proposition of the similarity between the world of electrons and that of musical harmonics —standing waves—, thereby happily giving rise to the surprisingly precise wave equation as the fundamental piece of revolutionary Quantum Physics. It thus seems that we are literally made of music, that we are pure abstract relationships in an unsubstantial reality, the acoustic appearance of the quantum void, the silent music and the sonorous solitude that amazed our mystics so much.

Standing waves are known by anyone that has played a musical instrument. The main feature of these waves is that they divide the vibrating element –string, tube or hoop– into completely equal sections. A guitar string, for example, cannot vibrate randomly – due to the fact that it has fixed ends and therefore has to vibrate in such a way that its ends remain motionless. This is what limits its possible variations and introduces whole numbers. The string can undulate as a whole (see Fig. 1-A), in two parts (see Fig. 1-B,), in three (see Fig. 1-C), in four, or in some other whole number of equal parts, but it cannot vibrate, for example, in three and a half parts or in five and a quarter.

In music theory, these successive standing waves are called “harmonic sounds” or “harmonics”. The unlimited series of these harmonics, originating from the “fundamental sound” of the complete original unity, define the varying degrees of the

FIGURE 1-A

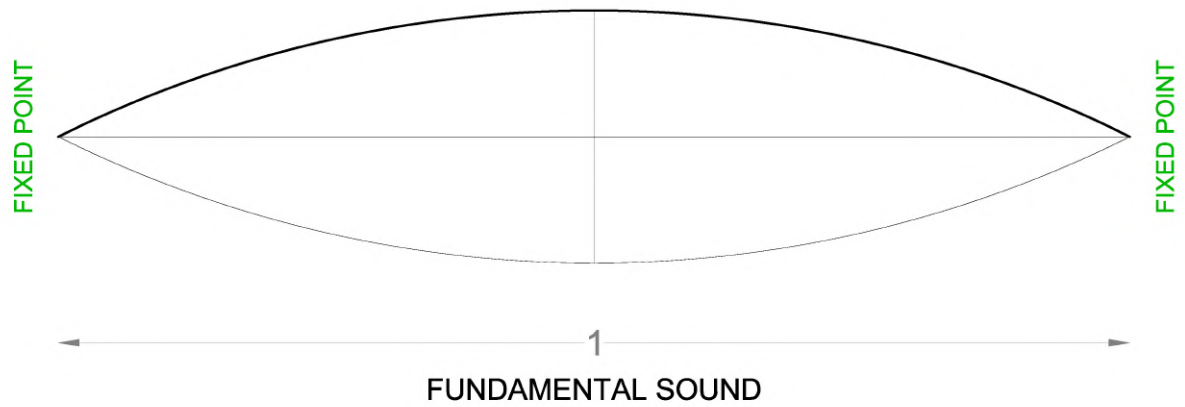


FIGURE 1-B

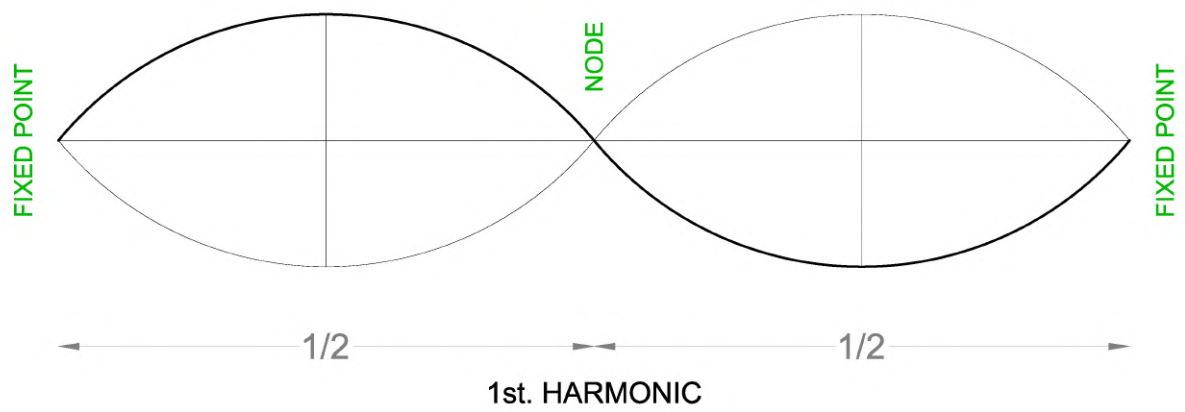
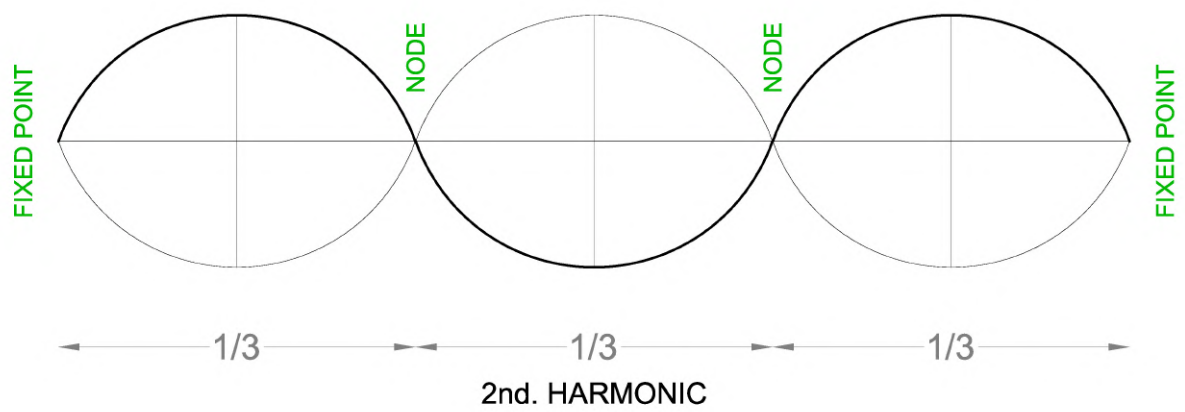


FIGURE 1-C



sonorous vibrations very precisely, i.e. the entire hierarchy of the levels of stability of the flow of music.

We thus see that both in the microscopic world of Quantum Physics and in the macroscopic reality of musical instruments, the “energies” —vibrations— do not occur continuously, but in a quantified way according to a hierarchy of standing waves. At any level of reality, a vibrating element —atoms or guitar strings— intrinsically possesses very precise potential levels within which the flows of energy are stabilized.

We stated previously that the new science considers the universe in a holistic way; in other words, that it perceives nature as an integrated wholeness, as a non–fragmented, undivided overall movement. We have also seen how the evolutionary dynamics of this *unified universe* displays its novelties in a discontinuous manner; just as the deepest transformations of evolution come about suddenly and abruptly. This generates a progressively more complex and more inclusive *hierarchy of organization levels*. We find, once again, a *vibrating element* —the evolving universe— that channels its energy flow in a highly defined series of *levels of stability*. Like atoms. Like musical instruments.

Both in the world of atomic physics as in the world of music, the secret of their sudden leaps and discontinuities in sound was revealed thanks to standing waves and musical harmonics. Could not the same occur in the field of evolution? Does it not sound very coherent that this unified universe that we are starting to discover generates similar creative patterns at its different levels of organization? Does it not therefore sound appealing that the sudden evolutionary changes in the history of the universe respond precisely to these same standing waves that are the explanatory key of both the subatomic and musical world? This has been the basic intuition that has given rise to our hypothesis regarding the rhythm of evolution which we will now summarize below.

### **Presentation of the hypothesis.**

A new theory has recently been posited regarding a unique process that explains hierarchically ordered diversity without any recourse to reductionism. This theory suggests, as a general cosmologic principle, the concept of the “stratified stability of potential levels” as the key to understanding the evolution of systems in disequilibrium. It basically suggests the existence of specific levels of stability around which energy streams gather and are organized, thereby permitting the subsequent and sudden upward leaps toward new layers or levels of progressively greater complexity. Our hypothesis constitutes a very precise specification in this appealing approach. Let us examine it in greater detail.

Taking the example once again of the guitar string, let us imagine that the guitar is tuned to *C* —the fundamental sound. If we make half of its length vibrate —the first harmonic—, we will obtain the same original note in a higher octave. If we induce the vibration in a third of the string —the second harmonic— we will get a *different* note, which in this case will be *G*. This means that a tonal novelty emerges with the second harmonic. Taking the new note as a fundamental sound, we can likewise iterate the experience as many times as we wish and we will always obtain successive scaled sound novelties with each second harmonic. Thus, when we induce the vibration of a

third of the length of the string, a creative leap will appear and with a third of the third, another one, and with a third of the third of the third, another new one, and so on.

This simple fact provides the key to our hypothesis. The proposal is very simple: considering the totality of time as a vibratory element —see Figs. 2—, the consecutive linked second harmonics, i.e. the successive thirds of the duration, will mark the emergence of evolutionary novelties. In other words, the second harmonics will define the “potential levels of stratified stability” through which nature’s creativity channels itself or the steps in the ladder of evolution through which the energy streams flow in their ascending process of creation of progressively more complex and conscious organisms.

Figs. 2 show the overall process in graphic form. If we take the entire course of time—from the “origin” to the “end”— as the fundamental sound, we have sketched the consecutive leaps in level in both directions: in Fig. 2-B, the section from the origin to the second node “P” of exteriorization, called the “exit” or “outwards” section; and in Fig. 2-A, the section from that same second node until the end —the “return” or “inwards” section. Fig. 2-C shows the joint trajectory, the overall ladder of evolution.

Summarizing our approach, we could say that, just like when a musical instrument emits a specific note, a wide range of its harmonics sound simultaneously, the universe as a whole likewise has, from its first original vibratory instant, a complete potential hierarchy of standing waves through which its creative flows can ascend. According to our scheme, starting out from the precise vibration that gave rise to the origin to the universe, the universal process commenced with a vertiginous explosion of creativity and leaps in level, gradually slowing down its rhythm on its ascending path toward a specific layer of the spectrum —“the fundamental sound”—, and from there on starts to progressively accelerate the rhythm of its leaps in novelty once again. And so on along the ascending path towards an unstoppable one-time vibration bringing infinite creativity to an end. Later on, we shall consider the profound meaning of these surprising poles: origin and end —Alpha & Omega—, as it is precisely there where we shall find the key to many of our questions.

Finally, in order to provide a coherent and ordered framework for our musical proposal of evolutionary rhythms, we shall now present another observation.

As stated earlier, if we tune a guitar string to *C*, its second harmonic — $1/3$  of its length— will be a *G*. Similarly, the second harmonic of this *G* will be a *D*. And that of this *D* will be an *A*. If we repeat the same operation indefinitely, over and over again, we will obtain a chain of sounds —*C, G, D, A, E, B, F#, C#, G#...*—, that exactly reproduce the order of the “sharp tones”. If we consider each note in this chain to constitute the characteristic sound of a determined “cycle”, we will thus obtain, with each  $1/3$  of the duration, a completely new sound and therefore a “leap in cycle”. Figure 3-A presents the successive fundamental sounds with their corresponding harmonics, while Fig. 3-B shows the order in which these sounds emerge, without taking in account the scale at which they appear. As we can see, after every seven cycles, the same series of notes is repeated in a higher semi-tone. We shall therefore use the term “series” to

FIGURE 2-A

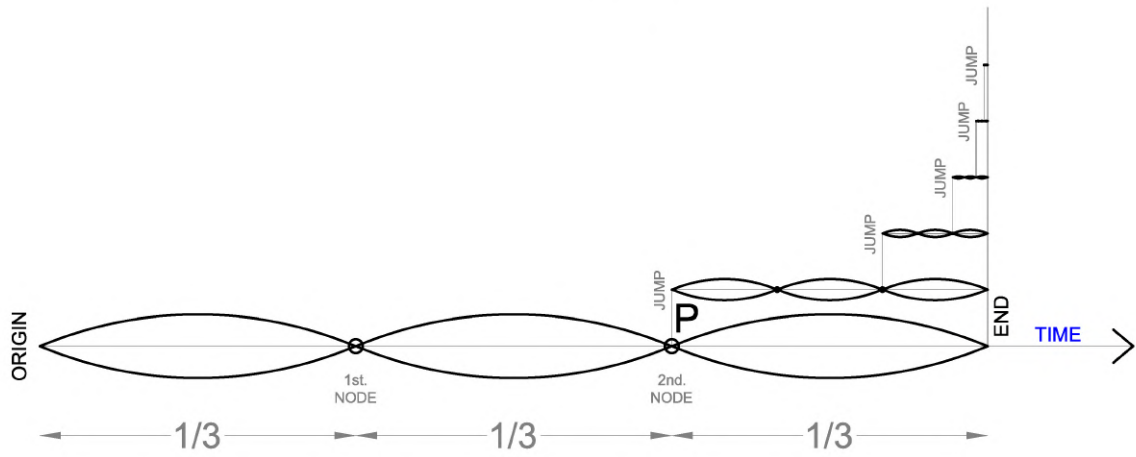


FIGURE 2-B

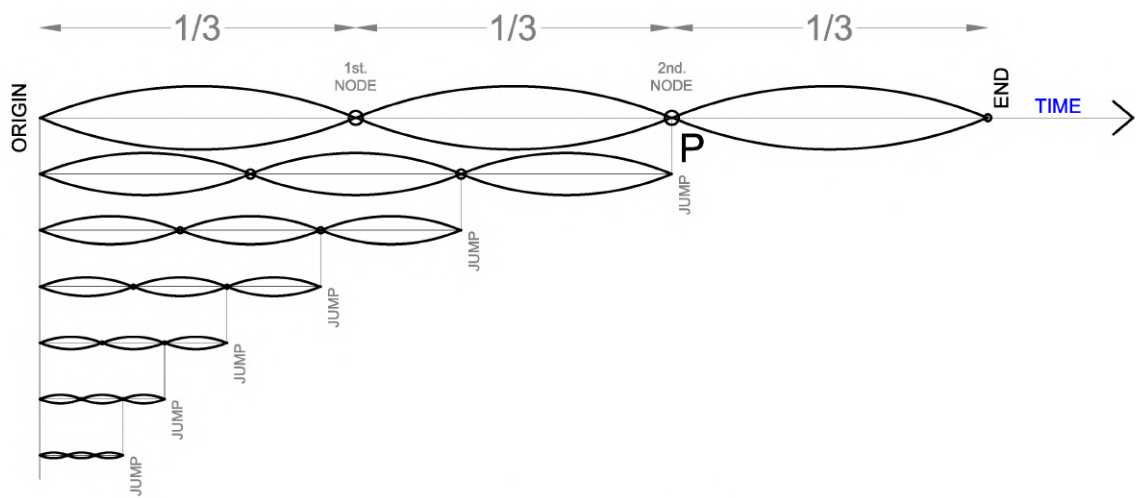


FIGURE 2-C

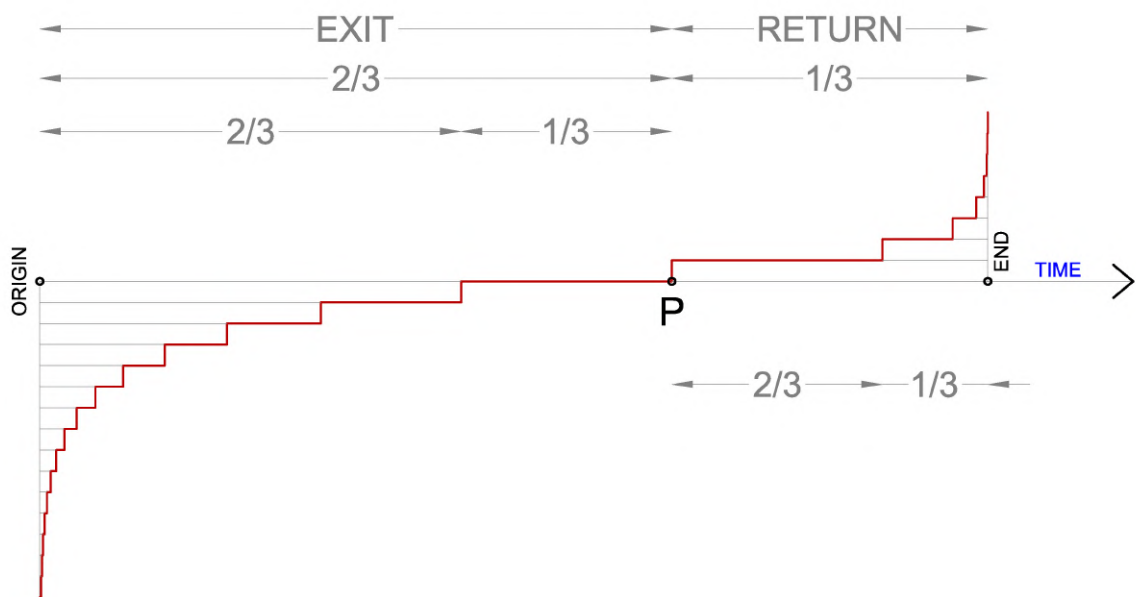
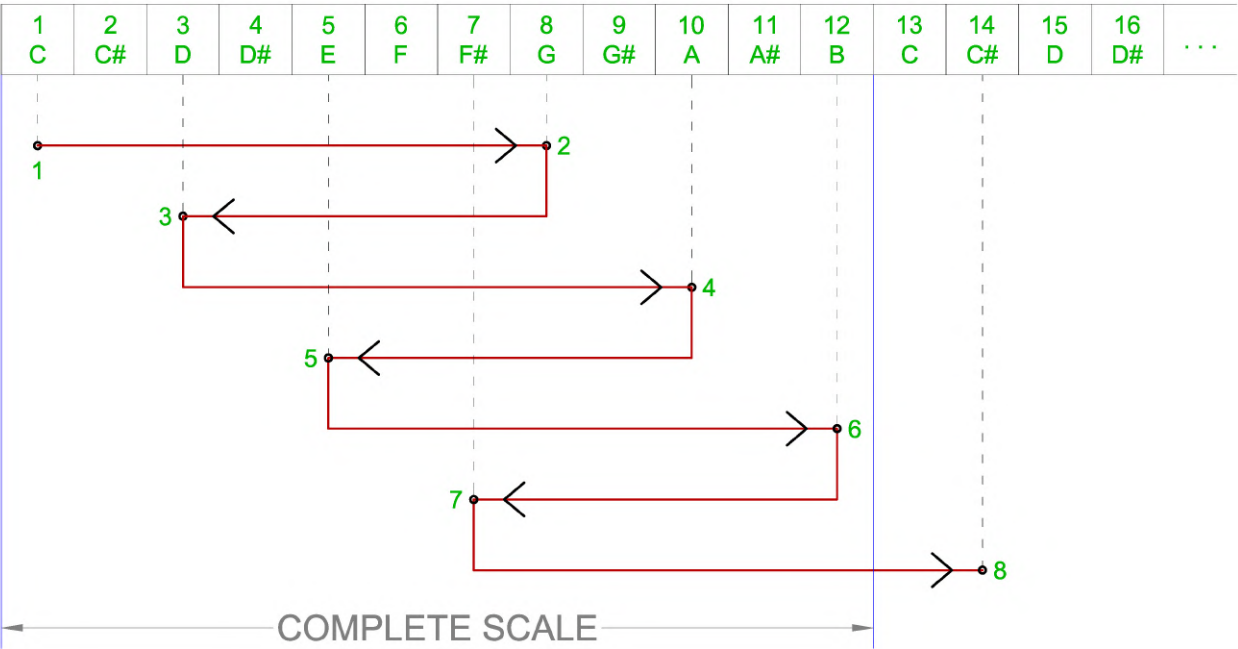


FIGURE 3-A

	1st. SERIES							2nd. SERIES		
	1st.	2 nd.	3 rd.	4 th.	5 th.	6 th.	7 th.	1st.	2nd.	...
FUNDAMENTAL SOUND	C	G	D	A	E	B	F#	C#	G#	...
1ST. HARMONIC	C	G	D	A	E	B	F#	C#	G#	...
2ND. HARMONIC	G	D	A	E	B	F#	C#	G#	D#	...

FIGURE 3-B



refer to each one of the subsequent groups of seven cycles that keep on appearing, and “series leap” to refer to the transitions between them.

Our entire hypothesis of evolutionary rhythms can be reduced to what we have just presented. Just that. As simple as that: a “cyclic leap” appears with each third of the duration, and after seven cyclic leaps a “series leap” appears. It is truly amazing for such a simple scheme to provide such adjustment good fit to the all the key steps of evolution, both in the global macrocosm —paleontological, anthropological and historical— as in the human microcosm —embryological and psychological. I am certain, dear reader, that after examining the test of the hypothesis that we are about to carry out below, you will be convinced that there is, in fact, some hidden secret and you will be even more surprised that no one has recognized this evident, clamorous scheduled rhythm of events. One cannot see the woods for the trees. Get ready!

### **Verification of the hypothesis in the macrocosm**

After having introduced our theoretical framework of rhythms of “cycles” and “series”, we shall now test whether such a “periodic table” fits the data that science presently offers.

Before starting, we would like to point out that the graphs we shall be using are of two types: rectilinear —Fig. 4-A—, in which you will see the evolutionary ladder corresponding to each series; and circular —Fig. 4-B—, in which each cycle is detailed independently. This will enable us to observe the multiple correspondences among the two. However, let us not forget that they are simply two different ways of expressing the same data.

Each cycle begins with the emergence of an evolutionary novelty —the “seed”— that transcends the model of the previous cycle. This seed begins to develop on the way to the first node of the cycle, fundamentally in the final stretch —which covers approximately 10% of the total duration of the cycle—, in which a first “sketch” appears. This sketch, in turn, displays its potential on the way to the second node, fundamentally in the final section —which also covers approximately another 10% of the total duration—, in which the characteristic model of the cycle reaches “maturity”. It is precisely at this summit of the second node that an evolutionary novelty emerges that transcends this model and gives rise to a new cycle.

For enthusiasts of the new evolutionary sciences, we would say that these second nodes of each cycle correspond to moments of the “chaos”, “creative unbalance” (I. Prigogine) or “beneficial catastrophes” (R. Thom), in which leaps in level or “bifurcations” occur. At these points, the “attractors” defining the previously expressed pattern disappear and those that define a new state subsequently appear “out of the blue”. Abruptly, the fundamental sound changes to its second harmonic.

Knowing that each cycle has a duration of  $1/3$  with respect to the previous one and that each series of seven cycles is therefore  $3^7$  times shorter than the previous one, it suffices to know the dates of some key events in the history of evolution to start “focusing” our theoretical framework on actual facts.

FIGURE 4-A

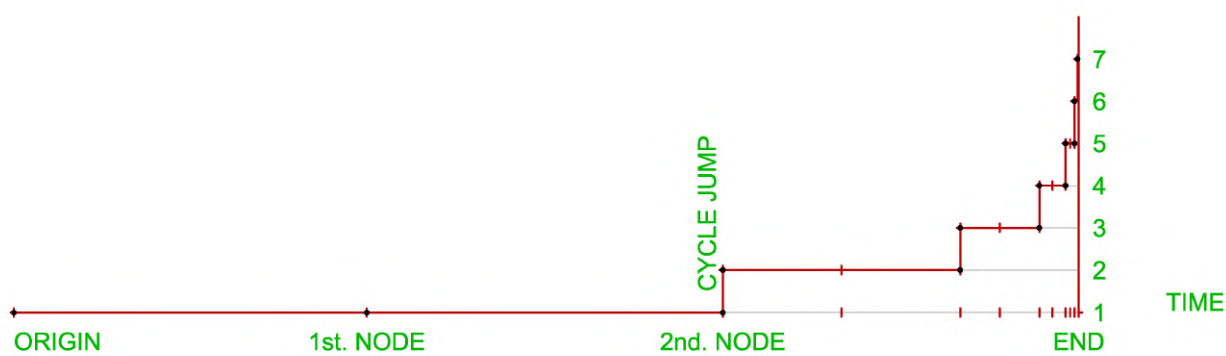
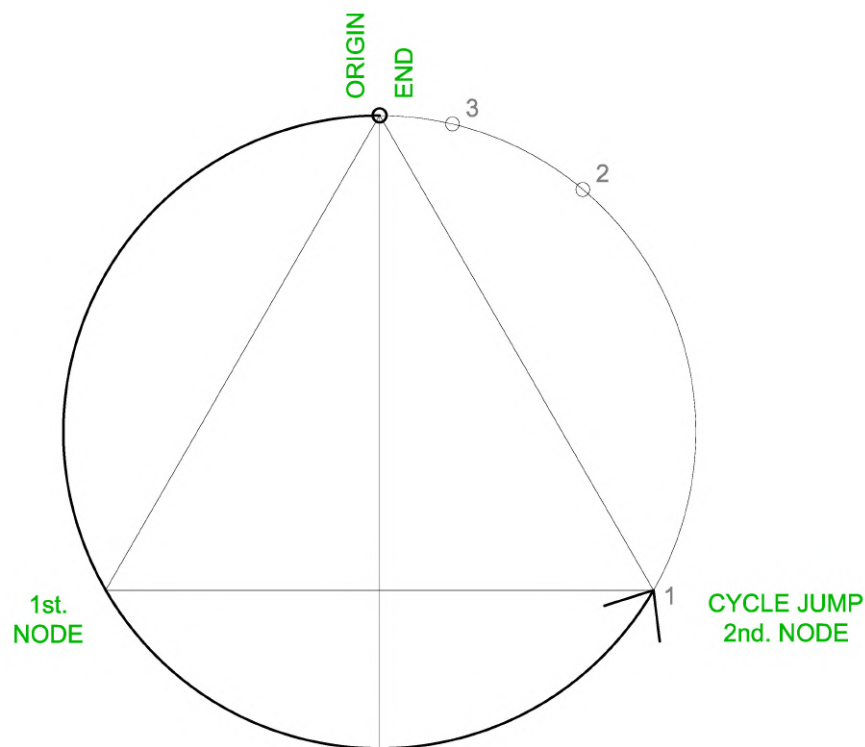


FIGURE 4-B





We know that the Big Bang, the seed of the universe, started some 13,500 million years ago, that following the formation of the Earth organic macromolecules, the seed of life, appeared more than 4.500 million years ago (1/3 of the duration of the universe) and that the emergence of the first human being —*Homo habilis*—, the seed of self-awareness, occurred little more than 2 million years ago (a period in time  $3^7$  (=2.187) times shorter than that of all life).

Placing the Big Bang, then, as the origin of the overall course of evolution and the formation of the Earth as the second node of this course, we shall call — as in Fig. 2-C— the path travelled between both points —from the potential energy of the original void to the formation of complex material— the “exit” process and the entire evolutionary unfolding of all life from then on the “return” process.

We shall now examine precisely this “return” section in greater detail. However, before doing so, we would like to remind the reader that one of the fundamental problems of the classic theory of evolution consists in explaining the marked discontinuities observed between the main taxonomic groups. Our scheme of rhythms, on the other hand, specifically marks the emerging moments of the subsequent taxonomical degrees of the phylogenetic process of human beings with extreme accuracy: **Kingdom:** Animal, in the first cycle, **Phylum:** Chordate, in the second cycle, **Class:** Mammal, in the third cycle, **Order:** Primate, in the fourth cycle, (**Superfamily:** Hominoid, in the fifth cycle), **Family:** Hominid in the sixth cycle; and finally **Genus:** *Homo*, in the seventh cycle!!! Let us look into this in detail step by step. I suggest that the reader switches between looking at Figs. 5 & 6 and reading the text.

The first cycle (A-1) of the return evolutionary process begins in the precise moment of the emergence of organic macromolecules, after the formation of the Earth and the rest of our solar system. In the course of evolution approached the first node (approx. 3.000 million years ago), prokaryotic cells —cells without a nucleus— began to form, the same occurring with eukaryotic cells —cells with nucleus— on approaching the second node (approx. 1.500 million years ago). It is precisely then when the first of the aforementioned major taxonomic bifurcations takes place, between the Plant and Animal **Kingdoms**, with the emergence of differentiation between *autotrophic eukaryotic* cells with cellulosic cell walls, many of which contained chlorophyll —plants—, and *heterotrophic eukaryotic* cells with only a fine plasmatic membrane never containing chlorophyll—animals—. There is then a leap in cycle.

The second cycle (A-2) then starts with the formation of eukaryotic cells. The first multi-cellular organisms begin to emerge around the first node (approx. 1,000 million years ago), developing their integration at the beginning of the Primary Era with the rapid expansion of marine invertebrates, giving rise to the first vertebrates —fish— when reaching the second node (approx. 500 million years ago). It is exactly in the ascent towards this second node —as foreseen by our scheme of evolutionary rhythms— when the explosive and surprising appearance of all the animal **Fila** —types—takes place, with our chordate ancestors last of all, giving rise to the first vertebrate fish. New change in cycle.

We would like to point out here that classical paleontologists, when analyzing the fossil remains in the consecutive layers of sedimentary rocks, found some clearly delineated borders in which there existed a sudden change in the nature of the actual fossils. Based

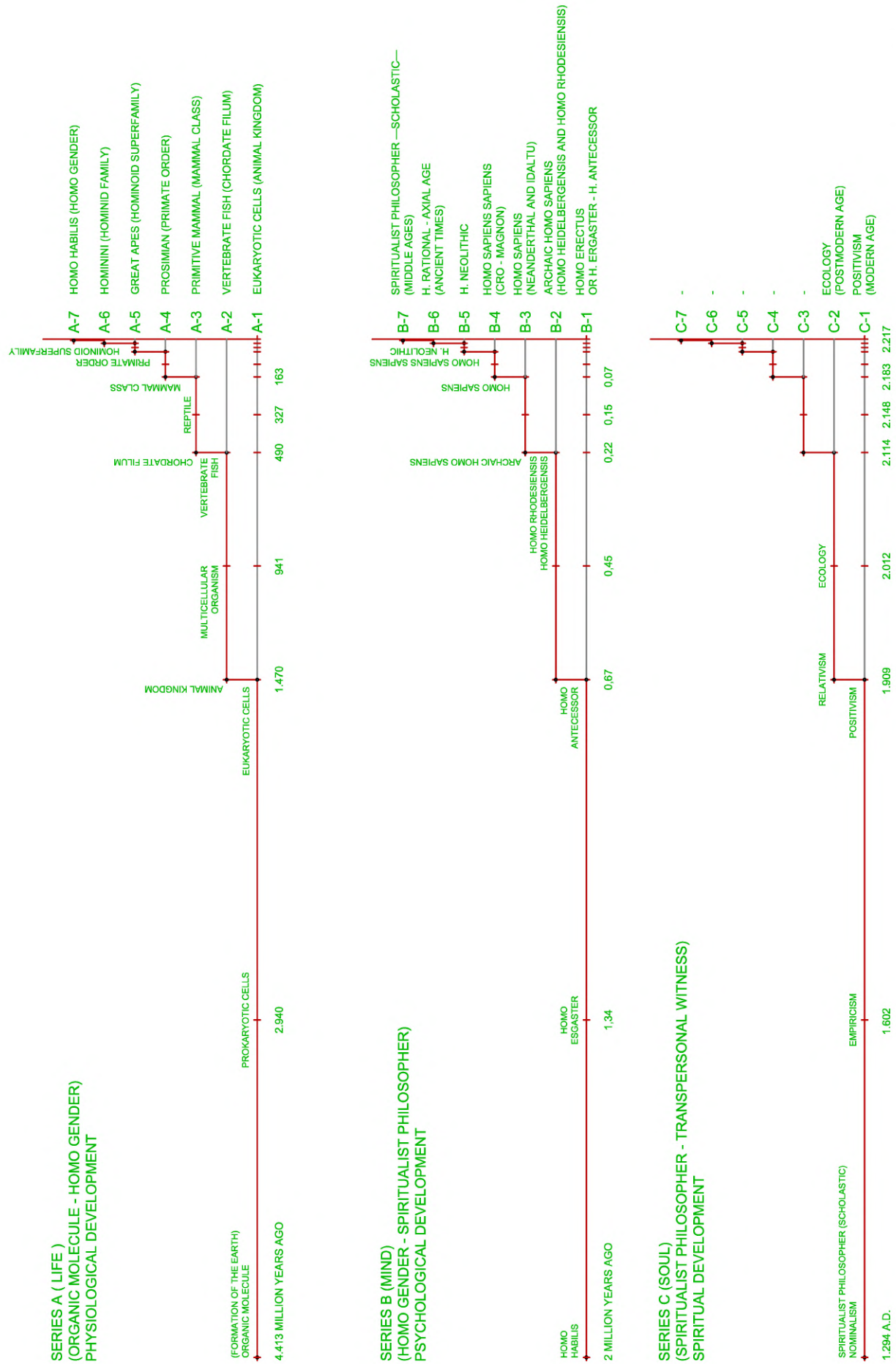


FIGURE 5

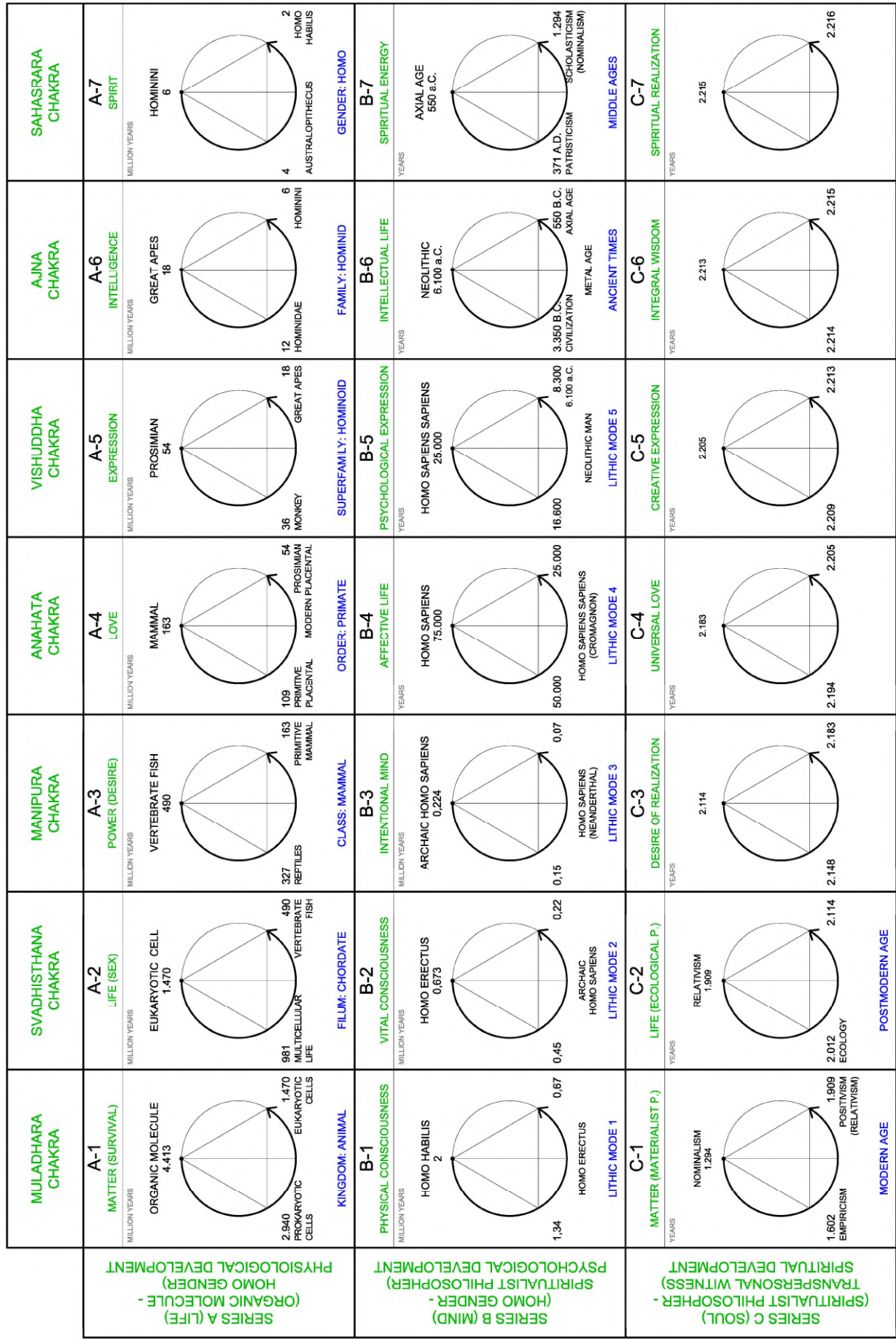


FIGURE 6

on such findings, they established the major Eras in Earth's History: the Primary Era or Paleozoic; the Secondary or Mesozoic; and the Tertiary or Cenozoic. Progressive oxygenation of Earth's atmosphere during the Precambrian period led to the death of many organisms. At the same time, however, it enabled others to use this new energy source to develop suddenly, in novel and diversified ways at the beginning of the Primary Era, during the so-called "Cambrian explosion" or "zoological Big Bang". This Primary Era ended with the massive extinction of the Permian period, in which almost 95% of all existing species were annihilated. This fact facilitated the major expansion of reptiles and the emergence of primitive mammals at the beginning of the Secondary Era. This Secondary Era also ended with the major extinction of the Cretaceous Period, which led to the disappearance of dinosaurs and permitted the great expansion of the modern placentals at the start of the Tertiary Era. These three expansive processes, with which the three major Eras of Earth history begin, occur —of course!— as the course of evolution approaches the second nodes in cycles A-2, A-3, A-4, respectively. Let us continue.

Referring back to the description of these cycles, we will say that the third (A-3) starts, as we saw previously, with the formation of the first vertebrate fish. On the path toward the first node (approx. 330 million year ago), we find that amphibians start to conquer dry land, an undertaking which, with the beginning of the Secondary Era, was finally completed by reptiles in their peak of development as the course of evolution approached the second node (approx. 165 million years ago). During the same period, primitive mammals started to emerge which —precisely!— constitute the third basic taxonomic bifurcation —**Class**— of human phylogeny. Change in cycle.

The fourth cycle (A-4), which starts with the appearance of mammals, has its first node (approx. 110 million years ago) at the moment when primitive placentals— insectivorous— appeared, which developed in a radiant and explosive way at the start of the Tertiary Era with the modern placentals —pro-simians— on approaching the second node (approx. 54 million years ago). It is —once more!— during the ascent towards the second node when the appearance of the primate **Order** takes place, defining a new basic level in our phylogenic journey. Leap in cycle.

The fifth cycle (A-5), which commences with the deployment of modern placental mammals, has its first node (36 million years ago) when actual monkeys— *aegyptopithecus*— appear. These were to develop when evolution approached the second node (18 million years ago) with the emergence of hominoids, which constitute the **Superfamily** of human phylogeny. Yet another change in cycle.

The sixth cycle (A-6) starts with hominoids, has its first node (12 million years ago) when the common ancestor of all the great apes —Hominidae— developed, and its second node (6 million years ago) when our ancestors separated from the chimpanzees, our last relatives of the **Family** of hominids, the new basic level of our phylogeny.

The seventh cycle (A-7) thus begins with the appearance of hominids. In the approach to its first node (4 million years ago), we find *Australopithecus anamensis*, which already showed biped locomotion, while on the ascent toward the second node (2 million years ago) *Homo habilis* comes into play, who starts to make rustic stone tools and inaugurates the category of **Genus** —homo— in our own phylogeny.

We have now travelled through the course of the first series (A) of our pattern of rhythms, and as stated, with the arrival of the second nodes in each cycle — seven in all— the totality of all the basic taxonomic levels of our species have appeared one after the other. That is, we have discovered that the major successive somatic transformations that our ancestors experienced. However, evolution continues unfolding and we shall now present a new series (B), which will reveal step-by-step the different stages that human beings have already covered in their way to modernity. Moreover, starting out from the generally accepted system in international archaeology proposed by Grahame Clark, we shall see how the successive lithic industries developed by our ancestors display the rhythm of our cycles precisely. Thus, “technical mode 1” (Oldowan) and its very long transition to mature Acheulean are developed in our cycle B-1; “technical mode 2” (full Acheulean), in our cycle B-2; “technical mode 3” (Mousterian), in our cycle B-3; “technical mode 4” (upper Palaeolithic), in our cycle B-4; and “technical mode 5” (Mesolithic), in our cycle B-5. As can be seen, the avalanche of linked “coincidences” continues!

We wish to make a brief parenthesis here to recognize that the accelerated pattern we observe in the generation of successive lithic modes was highlighted some time ago by French geologist André de Cayeux. In an article entitled *Quelle courbe suit l'Humanité?*, he drew a graph that clearly revealed the “rapid acceleration” of the evolutionary process of human beings. The stages he proposed were precisely “initial lithic culture”, “Acheulean”, “Mousterian”, “Aurignacian”, “Mesolithic”, “Age of Metals”, “Age of Machinism” and “Atomic Age”, in almost complete harmony with the cycles of our hypothesis.

Returning now to the testing of our hypothesis, we began the second series with the first cycle (B-1) which starts, as stated, with the presence of *Homo habilis*. According to the traditional approach, we could say that as we approach the first node (1.3 million years ago), we would encounter the emergence of *Homo erectus*, who would be the sole leading figure in this cycle with its expansion and development toward the second node (0.6 million years ago). A more recent approach seems to point in another direction as regards our line of ancestors. *Homo ergaster* —one of the first specimens of African *Homo erectus*—, would actually be the one that was to evolve toward *Homo antecessor* in the ascent towards the second node in this cycle.

The second cycle (B-2) would hence start with the presence of *Homo antecessor*, who on the ascent towards the first node (0.45 million years ago) was to derive in Europe towards *Homo Heidelbergensis* and in Africa towards *Homo Rhodesiensis*, both considered in traditional terminology as *archaic Homo sapiens*. They were to develop on the path to the second node (0.22 million years ago) in their own respective areas. Change in cycle.

The third cycle (B-3), would then commence with the presence of the two branches of *archaic Homo sapiens*. In Europe, *Homo Heidelbergensis* was to evolve towards *Homo sapiens Neanderthalensis* on approaching the first node (around 150,000 years ago), while in Africa, *Homo Rhodesiensis* was to evolve towards *Homo sapiens idaltu*, sometimes known as “protomodern” man because it already has all the characteristics of our species. Both branches were developing a type of lithic industry very similar to the one in Mode 3 —Mousterian— on the path towards the second node (around 75,000 years ago). Leap in cycle.

The fourth cycle (B-4) thus commences with the presence of the two branches of *Homo sapiens* living independently. However, as the course of evolution approaches the first node (around 50,000 years ago), the African species was to migrate toward Europe and, after a period of coexistence, Neanderthal man would end up disappearing, while *Homo sapiens sapiens* or Cro-Magnon would keep on developing, creating a Mode 4 — *Aurignacian*— technology on the path toward the second node (around 25,000 years ago), a point at which it was now the only species of the genus *Homo* on Earth. Change in cycle.

We shall make a pause here in our description of the cycles of this series B in order to explain that, from this time on, evolution will not be expressed biologically, that is to say via anatomic and physiological transformations, but rather that the cyclic leaps will basically be expressed through psychological and socio-cultural changes. In order to leave it very clear that the leaps we shall discuss below fit perfectly en bloc to historical data, we reproduce a few paragraphs from Ervin Laszlo's book *Evolution: The Grand Synthesis*:

“In the span encompassed by Paleolithic societies on the one end and modern information-based societies on the other, an entire succession of societal forms has unfolded. The nomadic tribes of the Paleolithic transformed into the settled villages of the Neolithic; these in turn gave way to archaic empires and to local kingdoms and city-states. The classical empires were followed by medieval princedoms, and these yielded to the rise of nation-states, some with vast colonies. Today the colonies have disappeared, and modern nation-states have spread to the four corners of the world.

With attention to both the technological and the social factors we can perceive a series of dynamic transformations in the development of societies. Nomadic hunting-gathering tribes domesticate plants and animals and transform into settled agrarian-pastoral societies; agrarian-pastoral societies evolve such technologies as irrigation and crop rotation and transform into agricultural ones; agricultural societies develop handicrafts and simple manufacturing technologies and thus transform into industrial societies; and industrial societies, under the impact of new, mainly information- and communication-oriented technologies, evolve into postindustrial societies.

History's arrow of time does not fly smoothly. Although the historical record is always complex and frequently obscure, it gives good reasons to believe that societies, the same as biological species, do not change at all times and in small increments. Rather, the mode of change appears saltatory and intermittent...”

I suggest, dear reader, that you be prepared for new surprises, because all of these stages proposed by Erwin Lazlo —which match the traditional classification of: **Upper Paleolithic, Neolithic, Ancient Times, Middle Ages, Modern Age and Postmodern Age** (in which we are really entering nowadays)— do fit, with utter precision, to each and every one of the anticipated cycles of our hypothesis of evolutionary rhythms! Let us verify this.

Remember that we had left our test in the fourth cycle (B-4) of the second series, with the development of Cro-Magnon, a cycle that corresponds to the stage of nomadic tribes of the Upper Paleolithic as well as hunting-gatherer societies.

During the fifth cycle (B-5), which commences with Cro-Magnon, we find near the first node (just over 16,000 years ago) an increase in gathering and the expansion of humanity. This was to lead, close to the second node (just over 8,000 years ago), to a generalization of **Neolithic** life, with the aforementioned settlements and agro-pastoral mode. A new cycle then commences (around 6,000 years BC).

The sixth cycle (B-6) starts with this Neolithic man. Around the first node (more or less 3,300 years BC), copper metallurgy arose, writing appeared —History *per se*. As we approach the second node (550 BC), the so-called “axial age” of the astounding 6th century BC arose. This was the time of pre-Socratic philosophers, Israel’s prophets, Buddha, Mahavira, the *rishis* of the *Upanishads*, Confucius, Lao Tse and Zaratustra, among others. Between both nodes, archaic empires, kingdoms and state cities developed. In other words, the mode of agricultural life or what is known as the **Ancient Times**. Change in cycle

The seventh cycle (B-7) of this second series starts with the emergence of philosophic man around 550 BC, who places the mythical thinking of the previous cycle in doubt. As the course of evolution approaches the first node (around the 370 AD), we see the appearance of Patristic philosophy in the Western tradition. This philosophy was fully developed as the second node approached (around the 1295 AD) with Scholastic philosophy. This cycle is the one that has been called the **Middle Ages**, with all its special features: princedoms and pre-industrial modes of life. With the appearance of Nominalism and the pre-Renaissance, still in this same second node, the abstract and metaphysical rationality of the medieval world was transformed into concrete and empirical rationality of the Modern world. And with the crisis, a new cycle appears. A new series: C.

The first cycle (C-1) of this new series thus commences with the nominalist-scholastic crisis that was to be the seed that germinated autonomously in Western culture, but was eventually to end up transforming the life of all human beings on the planet. Close to the first node (around the year 1600), mechanistic empiricism started to appear, developing to its fullest as the course of evolution approached the second node (around the year 1910) when Positivist Science was at its peak. The features of this cycle coincide with those of the **Modern Age**, the forming of states and the industrial way of life. At this point, the same crisis of the previous paradigm arose; on this occasion, the theories of relativity and quantum mechanics were the ones that were to stick the knife in the limitations of the mechanistic viewpoint. Change in cycle.

The second cycle (C-2) thus commences with Planck and Einstein and is not to have its first node until 2012. The new **Postmodern**, environmental, relativistic and pluralistic paradigm is thus in course. You are invited to take part!

If all of the basic steps of Evolution, from the formation of the Earth up to now, have fitted the projected rhythm in our “periodic table” with utter precision, we may presume that it will keep on doing so in the future. If this is so, an accelerated process of transformations will be experienced over the next two centuries that will dramatically conclude around 2217, in a moment of infinite creativity. Tell your great-great-grandchildren to start getting ready.

Before continuing, we would like to state that the hypothesis being presented here regarding a spiral evolution the rate of which accelerates on the way towards a final



pole of attraction was initially inspired by the pioneering proposals of Teilhard de Chardin —on “the convergence towards Omega”— and Aurobindo Ghose —on “the ascent towards Supermind”—, which in their time were considered completely preposterous by the world of official science. In recent decades, however, increasingly more research has been carried out in diverse fields and from different approaches, highlighting evolutionary acceleration and its orientation towards a singularity, findings with which our hypothesis obviously has many points of coincidence.

Let us mention here, for example, among the scholars of “Big History”, Akop P. Nazaretyan, Alexander D. Panov and Graeme D. Snooks and their “Snooks-Panov Vertical” theory, as our hypothesis coincides almost completely with the stages proposed by Panov, as well as with the rate of acceleration of 1/3 proposed by Snooks. We also coincide to a great extent with: the work by Luigi Fontappiè’s on the law of “Syntropy”, developed by Ulisse di Corpo and Antonella Vannini; the “Neo-orthogenesis” raised by my recently deceased fellow countryman Juan Luis Doménech Quesada; Carter Vincent Smith’s proposal regarding the “Accelerating Evolution of Integral Consciousness”; the “White Hole in Time” described by Peter Russell; John Stewart’s “Evolution’s Arrow”; Ken Wilber’s “Evolutionary Holoarchy”; Steve McIntosh’s “Evolution’s Purpose”; the “Spiral Dynamics” posited by Clare W. Graves, Don E. Beck and Chris Cowan; the studies by François Meyer and André de Cayeux on the “vertiginous acceleration of evolution and history”; the proposal by Jean Chaline, Laurent Nottale and Pierre Grou regarding “the fractal structure of the tree of life”; Richard L. Coren’s “Theory of Cybernetic Evolution”; John M. Smart’s “Acceleration Watch”; the “Singularity” of which Ray Kurzweil and the transhumanists speak. Terence McKenna’s “Timewave Zero”; and so on... It is clear that the paradigm is shifting, as Carter Phipps summarizes in his book on “Evolutionaries”. Let us continue investigating this.

### **Regarding the chakras**

Up to this point, we have presented our own verification of the hypothesis, basically with the data provided by Western science, which, for four centuries, has painstakingly studied the world of “outer” forms. It may be useful, however, to also take in account the observations that Eastern traditions have made which, for close to three millennia of the world of “inner” forms. Because evolution, as we stated at first, does not only keep on generating progressively more complex, more organized structures of energy and matter, but also keeps on unfolding deeper and more lucid levels of consciousness, simultaneously.

In this regard, the three series of cycles that we have been analyzing so far could be approached as follows. With the emergence of life in cycle A-1, consciousness, which up to this cycle was absorbed in matter, takes an inward leap, being identified with an incipient living organism —with a “subject”— that, on perceiving its environment full of “objects”, can act upon it and manipulate it in its own benefit. All of the first A series can be understood as a steady maturation of its capacity to act and perceive. With the emergence of the first human individual, in cycle B-1 of the second series, the conscious subject that already perceived the environment with great precision, takes a new inward leap and starts to perceive itself as an individual separated from the



environment. This is the surprising phenomenon of self-awareness, the “original sin” of the biblical story, the expulsion of human beings from the “paradise” of non-awareness. The entire second series concludes with the emergence of rationality in the “axial age” with a new leap toward consciousness, thus enabling the mind to think about itself and the discovery of the magic of self-reflexivity. The new series —C—, that then commences will lead —according to our hypothesis— toward a major evolutionary peak in the year 2217, in which humanity in general will reach the state of “transpersonal witness”. In this state, there will only remain a subtle form of dualism between the observer and that which is observed; a dualism that will finally disintegrate on discovering that both —the observer and the observed— are in fact one and the same thing and that they had never actually been separate.

As we stated previously, the Eastern mystic traditions have painstakingly delved into these deeper areas of consciousness, and have described their findings in great detail. Thus, the millenary Psychophysiology of the Hindus and in most especially, the Tantric tradition, has conscientiously studied the energy structures within human being and the universe. They claim that the flow of energy —*prana*— circulates through channels —*nadis*— and accumulates in vortices —*chakras*— constituting veritable storage batteries, transformers and distributors of this energy. Each one of these *chakras* is related to a nervous plexus and an endocrine gland. They therefore act as contact points between the physical body and the subtle structures, having specific psychological and spiritual functions. They claim that there are seven *chakras* distributed between the base of the spinal column and the top of the head and that they differ according to their different sound vibrations and characteristic activities: *Muladhara* (matter), *Svadhista* (life and sex), *Manipura* (power and desire), *Anahata* (love), *Vishuddha* (expression), *Ajna* (intelligence-mind) and *Sahasrara* (soul-spirit).

As we can see, Hindu Psychophysiology presents a wide spectrum of seven levels of energy stabilization that manifest in at least three different wrappings: biological, psychological and spiritual. As this evidently sounds very similar to what we have described in our scheme of rhythms —seven cycles in three subsequent series—, we shall now investigate whether the characteristics that define each of the *chakras* have any correspondence with the evolutionary cycles that we have previously described. Should there be considerable points in common between both approaches, we may find that not only the “rhythm” of evolutionary cycles is defined from the beginning, but also the characteristic content —the “sound”— of each one of them! Who mentioned chance?

At the top of Fig. 6, we have noted the complete series of the seven *chakras* in parallel with series A, B and C of the seven cycles of our hypothesis. In the case of our suspicion of correspondence between both approaches—that of the *chakras* and that of evolutionary stages— being correct, all of the correlative cycles of the different series—for example cycles A-5, B-5 and C-5—, should develop a common theme. Let us see.

The first *chakra*, *Muladhara*, is the basic center and sustainer of life, representing the domain of simple sensations and perceptions that belong to the material and physical world. It is related to the instincts of individual safety and survival, without which no life could exist. Its most characteristic behavior pattern is the simple stimulus and response. All of this perfectly matches unicellular life in our first cycle (A-1), which,

let us recall, spans the appearance of organic macromolecules after the formation of the Earth right up to the emergence of eukaryote cells.

The second *chakra*, *Svadhista*, is related to sexuality, the conservation of the species and the propagation of life; relationships between organs now take on significant importance. All of this is evidently in tune with our second cycle (A-2), which commenced with eukaryote cells, generated the first multi-cellular organisms, gave rise to sexual reproduction and deployed all its vital potential following the Cambrian explosion—the “zoological Big Bang”.

The third *chakra*, *Manipura*, is associated with power, will, desire and intentionality; the basic theme of this center is the fight for power, competing, ambition and domination. The third cycle (A-3) of this first series, let us recall, ended with the dominating expansion of the dinosaurs, in utter consonance with this *chakra*.

The fourth *chakra*, *Anahata*, is linked to love, compassion, affection and commitment; here rivalry gives way to cooperation and unconditional service. It is the center of the heart, the motherly instinct. All of this fully links to our A-4 cycle, which commenced with the emergence of primitive mammals and birds—of which it has been said that, because they are the only organisms that take care of their offspring, they are the “inventors” of love and affectivity—and ended with the radiant and explosive emergence of modern placental animals, opening the “age of the mammals”.

The fifth *chakra*, *Vishuddha*, is the effective center of communication, that of expression and self-projection and creative inspiration. It would match our A-5 cycle, which, let us recall, started with the emergence of the pro-simians, saw the development of the great apes and ended with the anthropoids, which, as is well known, possess a great variety and complexity of the modes of expression—language of gestures, sounds, attitudes, movements, facial mimic, and so on—in clear consonance with this fifth *chakra*.

The sixth *chakra*, *Ajna*, the center of intelligence, of knowledge, of wisdom, corresponds to cycle A-6, which, let us recall, encompasses the anthropoids right up to the emergence of the first hominids. As is widely known, besides human beings, all currently living species that still have the same basic features of that evolutionary stage are the animals with the highest intelligence on the planet, in clear consonance with the *chakra* we are talking now discussing.

The opening of the seventh and last *chakra*, *Sahasrara*, means the full flourishing of spiritual potential. It corresponds to the peak cycle, A-7, of the first series, which started with the emergence of hominids and ended with the appearance of *Homo habilis*, the first member of our human race, now entering the new area of self-awareness and evidently corresponding to this *chakra* of the “thousand petals”.

We have thus covered the entire chain of the seven *chakras*, from *Muladhara*—sustaining the material base—to *Sahasrara*—deploying spiritual energy—in total the consonance with our series of cycles, from the organic matter of A-1 up to the self-consciousness of A-7! Could it be that chance does not constitute, by any means, the ultimate criterion for understanding the creative dynamics of the evolutionary process? Let us continue with our investigation.

Within the first cycles of the second series, those relating to the most primitive humans, instead of only “checking” the connections with their correlative *chakras*, we shall simply “suggest” this correspondence. Later on, when applying our hypothesis of rhythms to the human microcosm and on observing the phylogenetic-ontogenetic parallelisms, we shall have more arguments with which to confirm these correspondences.

It is to be expected that in the first cycle (B-1) of the second series, physical self-awareness would gradually deploy —first with *Homo habilis* and later with *Homo erectus* (or *Homo ergaster*)—, subsequently emerging from merely unconscious fusion with the natural environment. These first human beings would thus have started to perceive their physical body, distinguished from the surrounding environment, and therefore would have been able to act consciously upon it, manipulating it to their own benefit —tools, mastery of fire, and so on. All this is in consonance with the features of the first *chakra*, which, as we stated, represents control over the most basic sensations and perceptions pertaining to the material and physical world.

In the second cycle (B-2), *archaic Homo sapiens* started to become aware of their vital and pranic drives and their motivations would basically revolve around pain-pleasure principles. In that case, this stage would clearly match the “vital” feature of the second *chakra*.

In the third cycle (B-3), the first *H. sapiens* will have deployed the “intentional mind” with the emergence of the wide-ranging capacity to create images, which allows the experiencing of prolonged emotions such as anguish and desire. This would be in consonance with the third *chakra*, which, let us recall, is associated with power, will, desire and intentionality.

The fourth *chakra*, as we said, is linked to love, compassion, affectivity and commitment. Our fourth cycle (B-4) in this second series spanned the period during which the Neanderthals first and Cro-Magnons later took center stage on the European continent. It is then when the nuclear family was given a boost and human beings start to worry about treating their sicknesses and the future of their dead. It is perhaps in this time when language started to develop, allowing the broadening and intensification of human relationships as well as the appearance of the “group mind”. All of this is clearly in agreement with the “affective” features of the *Anahata chakra*.

The fifth *chakra* is associated with communication, psychological expression and creative inspiration, which is fully in consonance with what happened in our cycle B-5, in which modern man —*Homo sapiens sapiens*, deployed all his artistic potential. Poorly developed up until then, Culture exploded in a multitude of facets: in the world of language, in the dazzling and surprising rock art of Altamira and Lascaux, in sculptures such as the Willendorf Venus, in reliefs, in horn and ivory works and so on.

The sixth *chakra*, as we have already stated, is the center of knowledge, intelligence and wisdom. Our sixth cycle (B-6), let us recall, starts with the appearance of Neolithic culture —in which human beings started to understand natural processes and by doing so were able to control and transform them (taming animals, planting seeds and so on)—, and via the development of civilizations, the discovery of the alphabet and the

progressive use of metals, reaches the “axial age”, with the emergence of the first philosophers. Its consonance with the *Ajna chakra* is clearly evident.

The opening of the seventh *chakra*, as already mentioned, means the full flourishing of spiritual potential. Our cycle B-7, as we have just seen, starts with the crisis of mythic thinking, as well as with the sudden emergence of the rational thinking in the “axial age”. In Western culture, this process spans Greek philosophy, through Patristic philosophy and up to the Scholastic philosophy at the end of the 13th century. The way of thinking developed in this period was mainly abstract, spiritualized and metaphysical, clearly matching the *Sahasrara chakra*. Simultaneously, this was also the time of the great sages and humanity’s non-dualistic mystics: Buddha, the *rishis* of the *Upanishads*, Lao Tse, Chuang-Tse, Jesus de Nazareth, Nagarjuna, Plotinus, Asanga, Bodhidharma, Hui Neng, Shankara, Huang-Po, Padmasambhava, Al-Hallaj, Ibn-Arabi, Dogen, Rumi, Meister Eckhart and the like. None of them “thought” about an external Divinity, but “knew by their own embodiment” that their truthful identity was in fact that Divinity. That is why we believe that, although they were in tune with the *Sahasrara chakra*, they better resonated with its expression in the following series —with cycle C-7—, in which humanity in general will discover, like all these sages had done before, that matter and spirit, energy and consciousness, object and subject are in fact non-dual polarized expressions of the unique absolute reality: the simple, ever-present Self-evidence. We shall return to this point later.

We have now concluded the second series, and the correspondence with the chain of the *chakras* has been very clear, from the mere physical awareness of *Homo habilis* through to the metaphysical rationality of the Scholastic philosopher. We shall therefore continue, testing now our third series —C—, at least in the cycle and peak that we have already covered.

The first cycle (C-1) of the third series started with the emergence of Nominalistic philosophy, which, due to placing emphasis on the specific, led to a crisis in the metaphysical thinking of the Scholastics. It then continued with all the deployment of empirical science and reached a peak with the materialistic Positivism of the 19th century. All this corresponds fully with the characteristics of the first *chakra*, which represents the physical and material world, as we have seen in previous series.

Allow us now to clarify what we have just been discussing. From the traditional perspective, the materialistic approach is rejected because it is believed to be a step back in relation to metaphysical thinking. However, according to our scheme, modern materialistic empiricism paradoxically represents a step forward in the spiritual process in relation to medieval religious “beliefs”. This is so because while the latter occupied the highest stage in the second series —B—, modern empiricism is situated at the beginning of the third series —C—, which, as it has greater depth and lucidity, is hence more “spiritual”, although its contents may have been only physical so far. In the long term, according to our pattern of rhythms this path will lead not to the “belief” in the world of the Absolute, but rather to “empirical” evidence of our own identity with the Absolute Itself.

As we have just stated, the second cycle (C-2) started with the first years of the 20th century, when the apparently solid mechanistic and materialistic paradigm of the Modern Age started to fracture with the emergence of the Theories of Relativity and

Quantum Physics. As opposed to the cold inflexibility, dogmatism and linear logic of the previous cycle, the new approach introduces reticular logic, perspectivism, environmental awareness, indetermination, pluralistic relativism, multiculturalism, respect and care for mother Earth, Gaia and life itself. The Postmodern Age that is starting is clearly in consonance with the second *chakra*, the focus of which, let us recall, is the conservation and promotion of life.

Summing up: the pattern of rhythms we have proposed fully matches both in rhythm and content, the empirical data from the sciences of Evolution and History. The first sixteen cycles of our “Evolutionary periodic table” coincide with utter precision with the totality of the stages that have occurred so far. It is obvious that the five remaining cycles of this third series —C—, will also mark the pattern of the accelerating process that will lead humanity towards the great evolutionary Peak in a couple of centuries, around the year 2217. The cycle of “ecological” content in which we are immersed right now, C-2, will reach its zenith within a century, around the year 2114. The following cycle, C-3, the focus of which will be the “desire for realization” will span the period up to 2183. Next, cycle C-4, whose central theme will be “universal love”, will reach its peak at the beginning of the 23rd century, around the year 2205. Cycle C-5, the focus of which will be “creative expression”, will develop through to the year 2213. The “integral wisdom” of cycle C-6 will reach its apogee in the year 2215. Finally, humanity’s “spiritual realization” will take place around 2217.

### **Regarding phylogenetic-ontogenetic parallelism**

We start out from the classical idea, present in very different cultures, that the human organism encapsulates everything; it constitutes an individual concentration of the world, a unity that reflects, as in a mirror, the totality of the universe. According to this approach, human development is a rapid recapitulation and integration of all the levels gradually deployed within the evolutionary process of the universe throughout its slow, drawn-out paleontological development.

Haeckel’s major contribution to the theory of evolution is what he called “the law of fundamental Biogenetics”, i.e., the parallelism between the growth of the individual embryo and the development of the species to which it belongs: “ontogeny, that is, the growth of an individual, is a short and fast repetition (a recapitulation) of the phylogeny or evolution of the lineage to which the individual belongs”. This means that during the course of individual development, the organism recapitulates its own evolutionary lineage so that the diverse forms which the embryo passes through represent the predecessors of such an organism. Note, however, that this is not a repetition of adult forms of these predecessors; it is their embryonic and developmental stages that are reproduced. This is why organisms which are close in the evolutionary scale —those that had a common descent until very recent periods— have similar embryos in their initial phases of gestation. It is only during the latter stages when differences become evident. In other words, because ontogeny reproduces phylogeny, the embryonic development of historically related animals passes through similar transformative processes which are longer lasting, the closer the degree of kinship. Darwin himself wrote in his *Origin of the Species* “community in embryonic structure reveals community of descent”.

In 1828, Karl von Baer, the major embryologist of his time, exclaimed, “I have two small embryos both kept in alcohol and I forgot to label them. Now I’m not able to distinguish their genus. They could be lizards, small birds or even mammals”. This is because all embryos from the chordate *phylum* —fish, amphibians, reptiles, birds and mammals— are almost identical during early developmental stages: zygote, blastula, gastrula, etc. Only subsequently do the special characteristic of class, order, family, genus and species start to appear successively.

Given that embryonic development reveals the ancestry of a species, within classic taxonomy—in the classification of living beings—, the most reliable criterion for affirming that two species had an immediate common ancestor above and beyond anatomical similarities was the similarity of their ontogenetic pathway. It is for this reason that phylogenetic taxonomy—already defined in the 19th century by Haeckel and Sachs— states that the systematic ordering of biological groups represents a schematization of evolutionary stages achieved over the course of time and, indicates the order of appearance of the different organisms that emerged upon the Earth.

It is becoming increasingly clear that evolutionary leaps essentially occur via branching within embryological processes: new pathways of embryonic and larval development separate at some point from the pre-existing ancestral pathways. The innovations responsible for the appearance of new species will thus occur, not only via simple mutation in a small segment of DNA, but through modifications introduced in the process of individual development, i.e., through “heterochronies” or discrepancies in the rhythm of ontogenetic processes. Of special interest within these heterochronies are the processes of “pedomorphosis”—the conservation of ancestral juvenile traits by the following ontogenetic stages of offspring — and also “neotenia” —pedomorphosis produced by retardation of somatic development—. Many of these cases of evolution by means of neotenia are well known, ranging from vertebrates —considered as tunicated neotenic larvae— through to human beings themselves, as proposed by Stephen Jay Gould on observing the clear similarity between the human adult and the young chimpanzee. Thus, the mechanisms of evolution may be due not only to the gradual selection of individual traits, but by these changes in rhythm given rise to profound anatomic modifications while opening up novel ecological possibilities. These sudden changes would also explain the absence of many “intermediate forms” in the fossil registry as these forms would never actually have existed.

In 1922, Grandjean corrected Haeckel’s claim that “ontogeny reproduces phylogeny” and proposed a complementary formulation: “ontogeny does not reproduce phylogeny, it creates it”, thereby suggesting that these branches in the ontogenetic pathway are precisely the ones that generate the novel leaps in phylogenetic pathways. These same approaches from the world of Biology are similarly repeated in the socio-cultural sphere when addressing the issue of whether anthropological development precedes the evolution of institutions, is a consequence of it, or both.

In line with the theory of “internal logic” in historical development, history is conceived as a self-deployment of inherent categories of humanity from the outset. All organicist approaches defend this approach and understand history as the “history of human life”, based on the parallelism between phylogeny and ontogeny. Thus, according to Vico, culture passes through the same phases as the individuals that compose it. Or according to Habermas, the internal logic of the cognitive development of a child serves as an

analogy for the self-understanding of communicative rationality throughout human history. Even Marx was also occasionally inclined to work with the theory of internal logic. In the Paris manuscripts, he holds that human beings may only develop the fundamental constitutive elements of the human essence and that progress is thus the unfolding of this essence.

According to our hypothesis, both the phylogenetic, historic or macrocosmic process and the ontogenetic, individual or microcosmic process are both overall or specific expressions of one and the same unique archetype of rhythms that define the dynamics of exit and return in the manifestation of the universe in time. Thus, both individuals and societies are constrained to progressively updating the successive levels of potential stability of the original matrix.

Returning to the embryologic issue we were discussing and focusing now on human beings, we have to say that, like other animals, human beings pass through the consecutive embryonic stages characteristic of their phylogeny before developing the physiological traits that verify their condition as humans. Their ontogenetic process then becomes much more similar to that of other species; the more so, the closer they are to their evolutionary scale. In the words of evolutionary scholar Francisco J. Ayala, “the human body is built following the same general scheme as other animal bodies, being more similar to anthropoids, primates, mammals and vertebrates in this descending order”. As we have seen previously, these stages correspond exactly to the four successive cycles of our hypothesis: A-5, A-4, A-3 and A-2.

Similar to the embryological process, the psychological development of human beings seems to recapitulate the successive perspectives displayed by their ancestors. John C. Eccles states that it may be postulated that all the transitions that are produced ontogenetically when passing from the baby to the child and then to the adult are situated precisely within the phylogenic process of human evolution, “the progressive development from the consciousness of the baby to the self-consciousness in the child provides a good model for the emergent evolution of self-consciousness in the hominids”. Likewise, the psychologist Jean Piaget states that the development of thinking in the child shows an intimate conformity with the evolution of consciousness in our species.

Along these same lines, Jung, after recalling Nietzsche words, “in sleeping and dreaming we once again work through the lessons of earlier humanity”, and added, “The supposition is therefore justified that ontogenesis corresponds in psychology to phylogenesis”. Ken Wilber equally states, “the same force that produced human beings from ameobas produces adults from infants. That is, a person’s growth, from infancy to adulthood, is simply a microscopic version of cosmic evolution”. He likewise affirms, “Very like the geological formation of the earth, psychological development proceeds, stratum by stratum, level by level, stage by stage, with each successive level superimposed upon its predecessor in such a way that it includes but transcends it.” Ken Wilber also states, “... there is an increasing reacceptance, among developmental structuralists, of the notion of phylogenetic/ontogenetic parallel: Primitive-paleolithic magic is similar in deep structure (not surface structure) to infantile-early childhood preoperational thinking; classic religio-mythic expressions are similar in deep structure to late childhood pre-operational thinking and beginning concrete operative thinking;

and modern rational science is top of the hierarchy with adolescent-to-adult formal operative and hypothetico-deductive reasoning.”

According to Wilber, the overall process of psychological evolution —that is the manner in which cosmic evolution operates in human beings— occurs in a most significant and coherent way. In each stage, there is a higher-level structure—one that is more complex and therefore more unified— which emerges by means of differentiation from the lower-order level that precedes it. This higher-order structure is introduced into consciousness and the self ends up identifying with this emergent structure. As it has differentiated from the preceding structure, the self transcends it and can thus operate on this lower structure using the instruments that the new emerging structure offers.

Ken Wilber denotes by “deep structure” the characteristic manner of any given level — a form that materializes all possibilities and limitations— and by “surface structure”, the specific manifestation of deep structure. All deep structures are undifferentiated, folded or enveloped in the unconscious field. The unconscious substratum is almost completely void of surface structures. This is something similar to Jung’s idea of the archetypes as “forms without content”. In Jung’s words, an archetype (deep structure) “is determined as to its content (surface structure) only when it has become conscious and is therefore filled with the material of conscious experience”. We all inherit the same essential deep structures, but each of us learns our own individual surface structures.

According to Ken Wilber, the fetus has fundamental ground unconscious, “In essence, it is all the deep structures existing as potentials ready to emerge, via remembrance, at some future point.” All deep structures are included or related to ground unconscious: the “archaic unconsciousness” is the past of humanity and the “emerging unconsciousness” is the future. Given that the higher structures embrace the lower ones, the higher ones have to be the last ones in developing. The transpersonal cannot be realized while the personal has not yet been formed. Development—or evolution— consist in a series of hierarchical deployments of deep structures parting from ground unconsciousness, starting from the lowest—matter— and ending with the highest—consciousness. When—and if— the totality of ground unconscious has emerged, then there will only be consciousness; all is consciousness as the Whole. As Aristotle put it, when the potential has been actualized, the only result is God.

### **Verification of the hypothesis in the microcosm**

Having previously verified the validity of our scheme of rhythms in the evolutionary dynamics of the universe—the macrocosm—, we shall now see whether this same scheme is also reflected in the developmental process of individual beings—the microcosm.

Assuming that human beings are in tune with the rhythms of the evolutionary cycles we have previously analyzed, and in the knowledge that, according to the study by Richard M. Bucke, the spontaneous emergence of what he called “cosmic consciousness” takes place around 34 years of age, we shall take cycle C-4, which has a duration of 34.17



years, as the base cycle to proceed with the verification of our hypothesis in the individual development of a fully realized human being.

Applying our overall scheme of rhythms—previously presented in Fig. 2-C—we obtain a first approximation to our proposal about this cycle of 34.17 years of duration as shown in Fig. 7-B. This figure shows the full course of a life, which, starting from the moment of engendering, deploys in a progressively drawn-out way to the “exit” section—or “outward arc” toward the pole of the “ego”, situated around 22 years of age—matching Wilber’s affirmation that the return process or “inward arc” does not generally start before 21 years of age—and initiates this section of “return”, in a progressively accelerated way now towards the final pole of illumination. In accordance to this scheme, in the “exit” section toward the maturation of “ego” a human being traverses both the complete series A—life—and B—mind—of our evolutionary periodic table and undertakes the return section through the C series—soul—and the following series in order to achieve full illumination around 34.17 years of age.

Comparing figures 7-A and 7-B, note how the overall macrocosmic and microcosmic patterns of development have identical structures. The only difference between them lies in the level at which pole P is positioned; that is, the pole toward which the “exit” section is oriented in each one of these patterns. In the macrocosm, it is situated at the “series leap” between “matter” and “life”—the appearance of organic macromolecules after the formation of the Earth—; while in the microcosm, it is situated at the “series leap” between the “mind” and the “soul”—the formation of the mature ego.

Attention! Take note of what we are proposing so as to enjoy the “magic” revealed in the following paragraphs. Pay special attention to the extreme simplicity of our proposal. We take, as such, the duration (34.17 years) of cycle C-4. We simply apply to this our overall pattern of rhythms. Then, setting the characteristic of a single point—the “mature ego” at pole P (21.92 years)—, the complete course of a human life is automatically delineated in full, in terms of both the rate of displaying the successive stages it goes through and the specific content of each of these stages. Pure “magic”! If our proposal is correct—which we shall soon test—, our life will be revealed as a fascinating dance to the beat of the music of the universe. Or, in other words, we will be nothing less than a radiant, condensed expression of the great cosmic symphony.

We shall now verify whether our forecasts fit the data provided by embryologists—for the intrauterine phase—and developmental psychologists—for the postnatal phase. We recommend simultaneously consulting Figs. 8 and 9 while reading the text.

We start by verifying the unicellular living phase, which in the macrocosm we called A-1, and which coincided with the emergence of prokaryotes first and then eukaryotes. The 28 days of women’s menstrual cycle is governed by a complex mechanism involving diverse organs and substances. During the first part of this 14-day cycle, the follicular maturation takes places, stimulated by the pituitary anterior lobe or gonadotrophic hormones, mainly the FSH. The primordial follicle contains a central cell—*ovogonia*—that first becomes a first-order *ovocyte* with a more robust nucleus and later—after being excreted during ovulation—transforms into a second-order *ovocyte*—with the corresponding chromatin depletion—, rendering it apt for fecundation. The A-1 cycle of our hypothesis, i.e. the one that deploys the unicellular stage in the macrocosm, according to our microcosmic scheme has a duration of precisely 14 days,

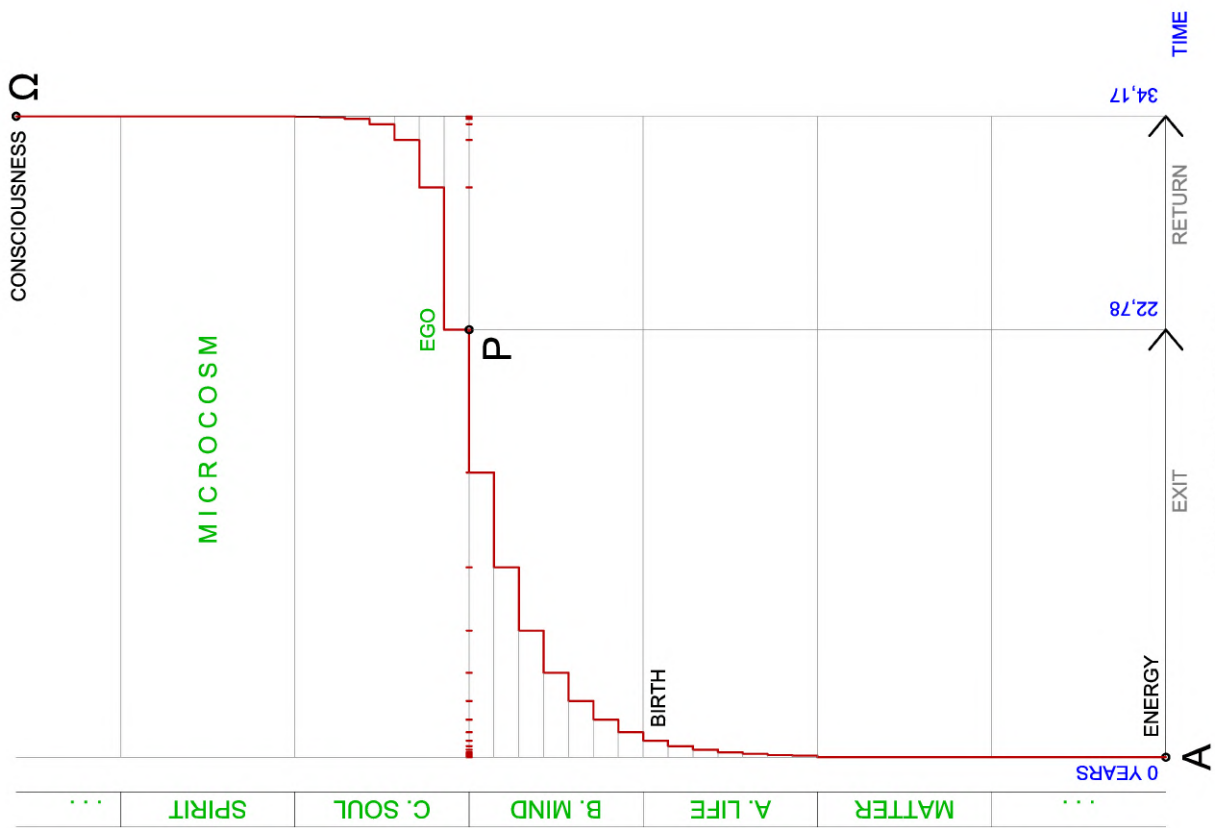


FIGURE 7-B

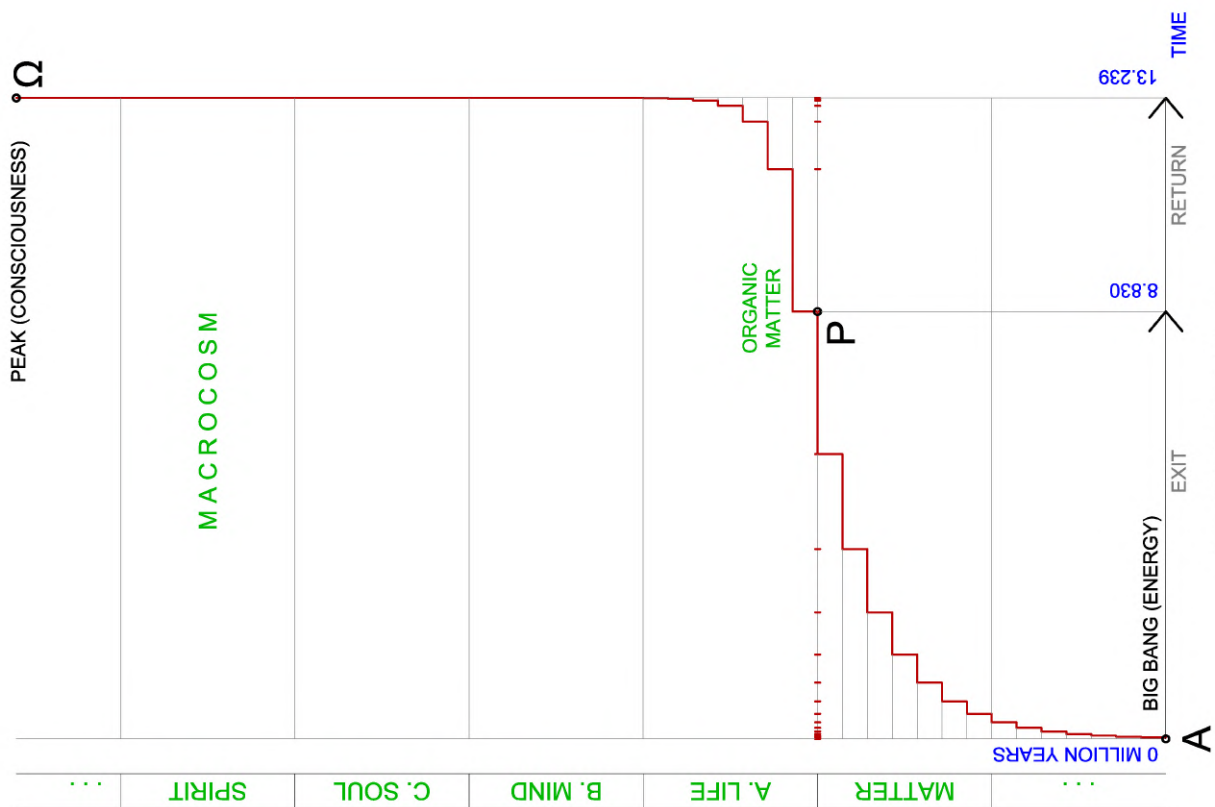


FIGURE 7-A

ENERGY	TIME SINCE ORIGIN	TIME SINCE FECUNDATION	TIME SINCE BIRTH	CYCLE	CORRESPONDENCES IN MACROCOSM	CHARACTERISTIC ACCORDING TO CHAKRAS	SPECTRUM OF CONSCIOUSNESS ACCORDING TO KEN WILBER	SPECTRUM OF CONSCIOUSNESS ACCORDING TO SRI AUROBINDO
	0 YEARS	- 42,72 DAYS	- 0,86 YEARS	A				
	18,99 DAYS	- 23,72 DAYS			ORGANIC MOLECULE			
	28,48 II	- 14,24 II	LAST MENSTRUATION	A-1	EUKARYOTES (ANIMAL KINGDOM)	MATTER (SURVIVAL)		
	42,72 II	0 II	FECUNDATION	A-2	CHORDATE (FILUM)	LIFE (SEX)		
	64,08 II	21,36 II		A-3	MAMMAL (CLASS)	POWER (DESIRE)		
	96,13 II	53,41 II		A-4	PRIMATE (ORDER)	LOVE		
	144,19 II	101,47 II		A-5	HOMINOID (SUPERFAMILY)	EXPRESSION		
	216,29 II	173,57 II		A-6	HOMINID (FAMILY)	INTELLIGENCE		
	324,44 II	281,17 II	(BIRTH) 10 DAYS	A-7	HOMO HABILIS (GENDER)	SPIRIT		
	1,33 YEARS		5,70 MONTHS	B-1	HOMO ERECTUS	PHYSICAL CONSCIOUSNESS	AXIAL BODY	PHYSICAL
	2,00 II		1,14 YEARS	B-2	ARCHAIC HOMO SAPIENS	VITAL CONSCIOUSNESS	PRANIC BODY	VITAL
	3,00 II		2,14 II	B-3	HOMO SAPIENS	INTENTIONAL MIND	IMAGINAL BODY	EMOTIONAL
	4,50 II		3,64 II	B-4	HOMO SAPIENS SAPIENS	AFFECTIVE LIFE	SYMBOLIC PREOP. MIND	DESIRE
	6,75 II		5,90 II	B-5	NEOLITHIC	EXPRESSION PSYCHOLOGICAL	CONCEPTUAL PREOP. MIND	INFERIOR MIND
	10,12 II		9,26 II	B-6	AXIAL AGE (ANCIENT TIMES)	INTELLECTUAL LIFE	CONCRETE OP. MIND	LOGIC MIND
	15,19 II		14,32 II	B-7	SCHOLASTISM (MIDDLE AGES)	SPIRITUAL ENERGY	FORMAL OP. MIND	
	22,78 II		21,92 II	C-1	POSITIVISM (MODERN AGE)	MATTER (POSITIVISM)	MATURE EGO	
	30,37 II		29,51 II	C-2	ECOLOGY (POSTMODERN AGE)	LIFE (ECOLOGY)	PLURALIST MIND	SUPERIOR MIND
	32,91 II		32,05 II	C-3	-	DESIRE OF REALIZATION	VISION - LOGIC	
	33,75 II		32,89 II	C-4	-	UNIVERSAL LOVE	ILLUMINED MIND	ILLUMINED MIND
	34,03 II		33,17 II	C-5	-	CREATIVE EXPRESSION	INTUITIVE MIND	INTUITIVE MIND
	34,12 II		33,26 II	C-6	-	INTEGRAL WISDOM	OVERMIND	OVERMIND
	34,16 II		33,30 II	C-7	-	SPIRITUAL REALIZATION	SUPERMIND	SUPERMIND
CONSCIOUSNESS	34,17 II		33,31 II	Ω	PEAK (2.217 A.D.)		NON-DUAL	BRAHMAN / PARAMATMAN

FIGURE 8

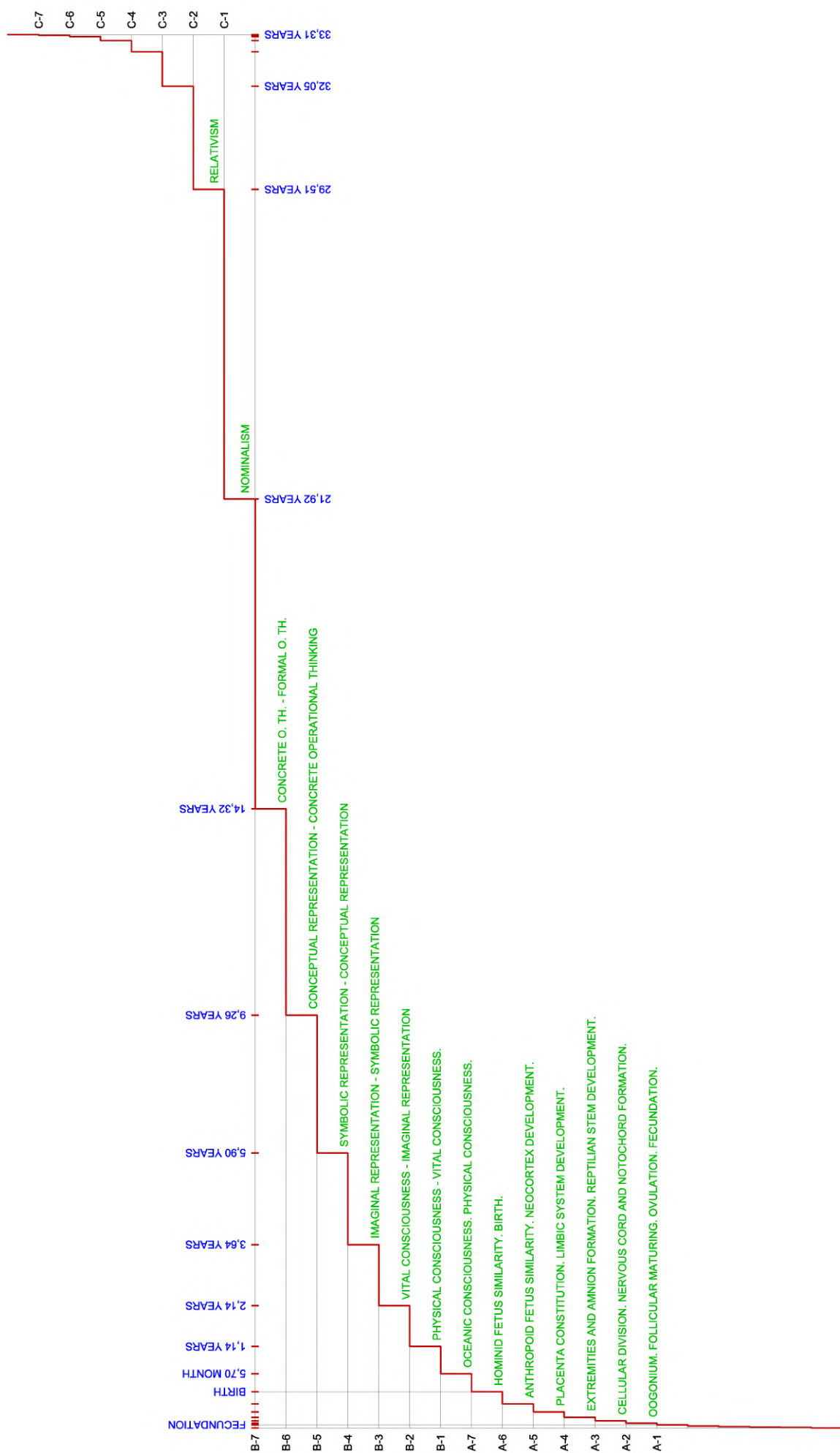


FIGURE 9

which coincides exactly with half of the menstrual cycle of follicular maturation until fecundation.

After being fecundated, the ovule starts a period of rapid mitotic divisions in which the zygote passes through stages of 2, 4, 8, etc. cells or *blastomeres*. The cells continue dividing, first forming a solid ball – *morula*—, which subsequently becomes hollow — *blastula*. The three germinative layers then start to differentiate —*endoderm*, *ectoderm* and *mesoderm*— and the cavity of the body or *coeloma* is soon formed. The dorsal nervous cord begins as a longitudinal depression that becomes progressively deeper until finally its edges join together, transforming into a tubular nerve cord. A sustaining cordoned-off formation is produced directly below, derived from the mesoderm, called the *notochord* —backbone— that is common to the chordate *phylum* as a whole, and from which it receives its name. The entire process takes place from the fecundation of the egg cell through to the third week of pregnancy.

As we have already seen, the characteristic stage of A-2 in the macrocosm is the one that displays multi-cellular organisms through to the formation of the diverse types — *phyla*— of animals, such as chordates. In our scheme for the microcosm, this cycle spans from a little more than three weeks from fecundation, which once again matches the embryologic data fully, not only in content, but also in duration.

The human embryo, as it nears the end of the first month, develops some muscular segments, called *miosomas*, at each side of the neural tube, which represent the origin of the skeletal muscle system, typical of all vertebrates. From the fourth week on, limbs— upper and lower— also start to be formed. At first, they are only small protuberances or *mamelons*. However, they soon start to grow and, during the sixth week, already constitute small, paddle-shaped expansions that will evolve into hands and feet. Fingers finally develop during the seventh and eighth week. During that time, the *amnios*, which during the first weeks of gestation was a very small vesicle, starts to increase in volume and progressively cover the embryo completely.

Cycle A-3 of our hypothesis started, in the macrocosm, with the first marine vertebrates —fish— and embraced the progressive conquest of dry land, first with the appearance of limbs in the *tetrapods* —amphibians— and then with the invention of that smooth, transparent membrane —the *amnios*— which protects reptile and mammal embryos. In our scheme for the microcosm, this cycle spans from the fourth week to the eighth, once again totally matching embryological data.

At the start of the third month of gestation, the embryo begins to be called the *fetus* — until the end of its intrauterine life— and the placenta begins to be formed. The hormonal functions of the ovary are progressively reduced until being replaced by this organ that acts exclusively from the fourth month onward. Thus, from this moment onward, the oxygen and all the other nutrients that the fetus needs will be absorbed from the mother's blood through the umbilical cord and the placenta, which will maintain the same general structure until the end of the pregnancy. It is also during this time when the typical hair of mammals starts to grow.

As we have seen in the study of the macrocosm, cycle A-4 of our hypothesis embraces the whole development of placental mammals, from the primitive insectivores through to modern primates. According to our scheme of the macrocosm, this cycle deploys

itself from the eighth week of pregnancy to the middle of the fourth month. Preciseness is once more present in terms of both content and rhythm.

From the fifth month of gestation on, the processes of the human fetus and those of the pongids continue with similar characteristics; for example, in chimpanzee, the form and size of the head, weight of the brain, position of the fontanelle, hair distribution and so on. As we have already stated, all these traits led S. J. Gould to propose that the appearance of hominids is due to a case of *neoteny* in our anthropoid ancestors.

The prediction in our scheme of the microcosm is that cycle A-5 displays itself from the middle of the fourth month of pregnancy to the end of the sixth month thus appears more than acceptable. Let us recall that apes developed first in this cycle in the macrocosm, followed by hominoids.

Cycle A-6 would then be the one that develops the specific characteristics of the hominid family. Although there is no longer any other species of this family but *Homo sapiens sapiens* —and therefore we cannot verify the similarities that we propose—, there are some indications that point in the right direction. That is, the similarities would be even greater than with the *pongids*. The key to explaining the gradual differentiation of human beings with respect to our anthropoid relatives lies mainly in the progressive slowing-down of our development, exactly as predicted in the overall pattern we propose. Therefore, although human beings and chimpanzees have more than 99% of structural genes in common and a strong resemblance in our fetal forms, there are small alterations in regulatory genes —those controlling the time of activation and deactivation of structural genes—, altering the rhythms in body growth processes and producing relatively major differences in adult forms —brain, hands, legs and so on— as well as in behavior. Retarded development and growth have allowed an astounding development of *cerebralization* in human beings, by prolonging the rapid cerebral growth typical of the fetus until later life. Or, likewise, the lower limbs in human beings, which are similar to those of the great apes at birth —it has been said that “babies are primates with short legs”—, in our case keep on growing for a long time, while those of our simian relatives, in comparison, remain underdeveloped.

It thus seems that due to this slowing-down of development, the similarities between human neonates and primitive hominoids would be even greater than with respect to simians. Suffice is to state the following: while chimpanzees reach 45% of their cranial capacity at birth and human beings, only the 23%, the *australopithecines* are in between, around 30%. The duration of this A-6 cycle, according to our scheme of rhythms, extends from the end of the sixth month of gestation until shortly after the ninth month, practically concurring with the time of birth. Or, in other words, when the cycle in which self-consciousness is about to flourish commences, the one that led to the expulsion of hominids from the “paradise” of animal integration with mother nature, the human creature is also expelled from the mother’s womb.

After birth, the human baby continues the slowing down of the developmental process, so much so, that it is been said that we spend our first year as an extra-uterine fetus. In fact, we are the only animal that grows more slowly and there is no other animal in which full development takes so long to achieve after birth. Orangutan, gorillas and chimpanzees grow until 11 years of age, while human beings keep on developing until they are 20 years old. This delayed growth is expressed through late maturation and

extended infancy. As S. J. Gould states in his book *Ontogeny and Phylogeny*, this delay has reacted synergically with another two distinctive human traits: intelligence—as the brain increases in size due to the prolongation of the trends of fetal growth, as well as providing a longer period of childhood learning—and socialization—as family units consolidate by means of increasing care from parents towards children that develop so slowly.

We shall digress briefly so as to make a few comments on the evolution and development of the nervous system.

A few decades ago, the American physician Paul MacLean proposed a thought-provoking model, known as the “triunic brain” or “triune brain”. This model aimed to explain the function of existing traces of evolution in the structure of the human brain. MacLean argued that our skull actually contains three brains: the reptilian, the limbic system and the neocortex, each of which represents a different evolutionary state. They are formed one after another in an overlapping manner, from the inside out, ontogenetically during embryonic and foetal development and phylogenetically during the course of evolution from the first fish to modern man. These three brains are connected to one another, like “three interconnected biological computers”, though each retains its own distinct characteristics.

The R-complex (or reptilian brain), which comprises the brainstem and cerebellum, began to form evolutionarily about 500 million years ago and developed throughout our cycle A-3, after the formation of the nerve cord in the previous cycle. It is basically responsible for the primary vital functions, i.e. basic survival instincts. It is an action-oriented brain, responsible for automatic impulsive behaviour, i.e. fight-or-flight, reacting to direct stimuli, without involving any emotional process.

The limbic system (or paleomammalian brain), which includes the hypothalamus, hippocampus and amygdala, originated over 150 million years ago and evolved throughout our cycle A-4. As a whole, it is the seat of emotions and affective memory. This ability to bring the past into the present encourages learning and facilitates relationships, as evidenced by the evolution of mammals.

The neocortex (or neomammalian brain), formed by the neuronal layer covering the outer area of the brain, began to develop some 60 million years ago and gradually increased in size during in our cycle A-5 and the following. There is a direct relationship between this development of the cerebral cortex and social development: the more complex and organized societies are, the greater the size of the neocortex of its members. The neocortical system is responsible for the higher intellectual processes and is the source of the increasing cognitive abilities of higher primates.

This same evolutionary sequence: brainstem, R-complex, limbic system and neocortex, develops approximately from the inside out, during the embryonic and foetal development of every human being. As already stated, the neural tube begins to form in the 3rd week of gestation and, after it has closed completely, the cephalic end begins to expand substantially past the 4th week, giving rise to the three primary vesicles, from which the entire brain originates. Or, for example, the medulla oblongata (R-complex component), which emerges at the end of the 8th week from the myelencephalon—one of the five secondary vesicles—, achieves its definitive form around the 20th week of



gestation. Or the hippocampus (limbic system component), which has a similar appearance in all mammals, begins to unfold from the 13th week onwards, acquiring the adult form a month and a half later. The cerebral cortex (neocortex) develops later, mainly from the 5th month of pregnancy onward, when the surface of the hemispheres, which until then is almost completely smooth, begins to generate grooves and convolutions during the 6th and 7th months. These features dramatically enhance the surface area of the brain and facilitate the number of connections between neurons.

This parallelism between the phylogenetic and ontogenetic sequences of the development of the nervous system continues even after birth. For instance, there are some neurons known as fusiform neurons –responsible for connecting different regions of the brain– that are only found in humans and some great apes. It seems that the number of these neurons increased rapidly and dramatically with the emergence of *Homo sapiens*. Their most thought-provoking aspect, however, is that these cells currently do not exist in new-born babies, but begin to appear within a few months after birth. They then increase significantly in number between one and three years of age, coinciding precisely with our forecasts for the correlative stage for the emergence of *H. sapiens* in our individual development, as we shall see below.

We close this digression on the evolution of the nervous system here and now continue with the testing of our proposal. We had left off at the movement of birth, after our cycle A-6. From this point on, we shall take as our reference framework the hierarchy of psychological levels so thoroughly presented by Ken Wilber throughout his body of work. Let us see the first of these levels, which, according to our pattern of rhythms should correspond to the transition from cycle A-7 to cycle B-1, as the former involves gestation and is the latter, deployment.

**Uroboric-axial body.** Shortly after birth, the child’s perception begins to float in what is known as the pre-personal “uroboric” kingdom. The *uroboros* is still collective, archaic and primordially oceanic, but it already possesses some type of self-limitation. When the sensation of the infant self begins its evolution from the pre-personal *uroboros* to the individual organism, we see the emergence and creation of the organic and bodily self. By the term “axial body”, we are mainly referring to the fact of feeling the physical body as something that differs from the environment. The baby has a physical body at birth, but it does not recognize the axial body until the fourth or sixth month of age. As the self-awareness of the child self begins to be centered and distinguish its individual organism, it also assimilates an ambiguous, yet still undefined threat of extinction. Therefore, simple, brief survival becomes a priority in this stage. Aurobindo calls this level, the “physical” level.

This stage corresponds with cycle A-7 (and B-1), which roughly spans from birth to the middle of the first year and leads to the emergence of the *Mulahara chakra*, whose main feature is “physical consciousness”. It is also related to the simplest sensations and perceptions of the material world, along with the survival instinct. In the macrocosm, this phase corresponds with the appearance of self-awareness in *Homo habilis*. The precise correspondence is therefore complete in terms of both rhythm and content.

**Pranic body.** Given that a specific organic self begins to emerge, the typical emotions of this self likewise emerge. This basic emotional behavior is called the “pranic level” or “pranic body”. Although emotions are still relatively simple and primitive in this stage, the incipient ego has a certain consciousness of the qualities of pleasure and pain



and therefore the search for pleasure and the avoidance of suffering become a strong psychological force in this period. This level is also characterized for being full of an overall, still undifferentiated sexuality. Aurobindo calls this phase “vital consciousness”.

In our hypothesis, this phase corresponds with cycle B-1 (and B-2), which develops between 5.7 months and 1.1 years of age and leads to the emergence of the *Svadhista chakra*, whose core feature is “vital and sexual consciousness”. The correspondence is once again absolutely clear. In the macrocosm, this stage corresponds to *Homo erectus*.

**Imaginal body.** The emergence of the infant’s ability to extensively create images marks a decisive point in the development process. When babies are about to reach the age of two, they are able to imagine objects that are not present with great accuracy. This enables an enormous burgeoning of their emotional life, as images are capable of evoking the same types of emotions and feelings as the actual object or person. Moreover, for the first time, the child may experience prolonged emotions, both of anguish—which is none other thing than imagined and hence maintained fear—and desire—which is none other than imagined pleasure. The image leads to the satisfying of desires and the lessening of anguish.

In our table of rhythms, this stage corresponds to cycle B-2 (and B-3), which develop between 1.1 and 2.1 years of age and leads towards the emergence of the *Manipura chakra*, whose main theme has to do with desire and the intentional mind. The accuracy of our scheme is therefore complete.

**Social cognition (Symbolic pre-operational mind).** Between two and four years of age, the child starts to awaken to symbolic representation. A symbol goes beyond a simple image, because while images represent objects pictorially, symbols do not represent them figuratively, but verbally. The emergence and acquisition of language is, by all odds, the most significant period of the “exit” section in the vital cycle of the individual. Language and emergent abstract thought functions greatly expand the affective and kinesthetic world of the child. Through language, one may anticipate the future, make projects and channel the actions of today towards the future. This enables the onset of the sublimation of emotive-sexual energy, transforming it into more subtle, more complex, fully developed activities. As it moves forward toward cognition and social consciousness, the system of self is faced with the need to belong—and love—a social group that is greater than the individual bodily self.

This phase corresponds with cycle B-3 (and B-4) of our hypothesis, which develops between 2.1 and 3.6 years of age and leads to the emergence of the *Anahata chakra*, whose characteristic feature revolves around “affective life”. The correspondence can once more be seen to be very clear, in terms of both the temporal rhythm and content.

**Early ego/personic stage. (Conceptual pre-operational mind).** The child starts to transfer its central identity to verbal and mental realms. Usually, between 4 and 7 years of age, the child starts to discover the world and its conceptual representations. A concept is a symbol that not only represents the object or an action, but also a class of objects or actions. Although children still cannot operate or coordinate upon these conceptual representations in this phase, they already have a fairly coherent mental ego which differs from the body, transcends the simple biological world and can hence

operate to a certain extent in said biological world as well as in the previous physical world, using the instrument of the simple representative mind. It is the level that Piaget calls “preoperational intuitive”.

In our hypothesis, this stage is equivalent to cycle B-4 (and B-5), which develops between 3.6 and 6 years and leads to the emergence of the *Vishudha chakra*, whose characteristic theme is “psychological expression”. The correspondence is yet again much more than acceptable.

**Mid egoic/personic stage. (Concrete operational mind).** The trend pointed out in the previous cycle is consolidated as a whole with the emergence —generally from the age of 7 years onwards— of what Piaget calls “concrete operational thinking”. That is, the conviction of being able to operate in both the concrete and bodily world by means of concepts. This mental level, which dominates the ego/person mid stage, is not capable of imagining possible or hypothetical relationships, and still cannot operate upon itself. Nevertheless, unlike its predecessor —the representative mind—, the concrete operative mind can start to assume the place or *role* of others. It is also the first structure that can really start to develop regulated operations, such as multiplications, divisions, classifications, the capacity to create hierarchies and so on.

This phase corresponds to cycle B-5 (and B-6) of our table of rhythms, which develops between 5.9 and 9.3 years of age and leads to the emergence of the *Ajna chakra*, whose central feature is “intellectual life”. The matching is once again very clear.

**Advanced ego/personic stage (Formal operational mind).** Within the period of adolescence, later ego/person stage, another extraordinary differentiation starts to take place. Basically, the self simply begins to diversify from the concrete thinking process. On doing so, the self can, to a certain extent, transcend this process and thus operate in it. It is not surprising, therefore, that Piaget calls this stage the “formal operational stage”, as it enables one to operate upon one’s own concrete thinking —to think about thoughts—, or, in other words, to work with formal or linguistic objects as well as with physical or concrete objects. It is the first clearly introspective and self-reflective level, which is able deal with the subjective mind and is capable of imagining possibilities that are not present, at the same time as carrying out hypothetical-deductive or propositional reasoning. Among other things, this enables the individual to adopt different points of view which are plural and universal. This stage starts to emerge around 12 or 13 years of age.

In his book *Up from Eden*, Ken Wilber divides this “advanced egoic/person” period we are discussing here into three phases: **lower** (that spans from Old Age to 500 BC), **middle** (from 500 years BC to 1500 AD) and **upper** from 1500 to the XX century), all three of which exactly correspond to cycles B-6, B7 and C-1 of our hypothesis.

The **lower** phase of this stage of “formal operational thinking” corresponds, as we have just stated, in our hypothesis of rhythms to cycles B-6 (and B-7), which develop between 9.3 and 14.3 years of age —exactly coinciding with the emergence of this modality of thinking in the adolescence— bringing with it, the emergence of the *Sahasrara chakra*, whose main feature revolves around “spiritual energy”, which appeared in the “axial age”, in clear consonance with the self-reflective, introspective and subjective capacities of this level. Correspondence is once again very clear.

The **middle** phase of this stage of “formal operative thinking”, as stated, corresponds in our pattern of rhythms with cycle B-7 (and C-1), which develops between 14.3 and 21.9 years of age and leads to the emergence of the *Muladhara chakra*, whose central theme is related to the achievement of material objectives in a primordially materialistic world. All this perfectly matches the transition from “idealism”, typical of youth, to “pragmatism”, typical of incipient maturity. It is here when—in line with Wilber’s opinion—the “return” route commences.

**The upper** phase of this stage of “formal operative thinking”—which Wilber refers to as the “mature ego”—, corresponds, as mentioned, to cycle C-1 (and C-2), which develops between 21.9 and 29.5 years of age and leads to the emergence of the *Svadhastana chakra*, whose main characteristic is the conservation and spreading of life. All of this is clearly in consonance with the growing ecological sensitivity of this stage of life.

In cycle C-2, between the age of 29.5 and 32, the individual develops what is called the “pluralist mind”, which places emphasis on relationships, dialogue, networking, diversity, multiculturalism, the revitalizing of values relativity, respect and care for life, all of which define, in general, the emerging ecological paradigm. We are thus entering a higher cognitive structure to formal operative thinking. This new level, which has been called “integrative”, “creative synthetic” or “vision-logic”, is not limited to establishing linear relationships, but organizes networks of relationships. This means that, just as the formal operative mind “operates with” the concrete operative mind, the vision-logic mind “operates with” the formal operative mind. The panoramic vision-logic level thus apprehends a massive network of ideas, in addition to its mutual ideas and interrelationships. This structure constitutes the onset of a higher capacity to synthesize, establish connections, establish relationships between truths, coordinate ideas and integrate concepts.

According to our hypothesis, this new cognitive structure will deploy collectively in cycle C-3, which will start to emerge in a century’s time, and in individual human beings may flourish around 32 years of age. Verification of all this, as well as the forecasts of successive cycles will have to await future generations. What can be deduced from our periodic table is that around 2217, human beings around the age of 33—like Buddha and Christ— will be able to attain full spiritual realization at the peak of evolution. At the end of the road, definitive Reality will be revealed, which, far from simply being yet another stage, will surprisingly be revealed to be the very substance of all the transited stage. That is to say, there will not be a new level, but we will perceive that in fact we have never left this total Reality that is, and always has been, our ultimate Identity.

### **Some final observations**

Having tested our hypothesis of developmental and evolutionary rhythms’ with both the data referring to the macrocosm—paleontological, anthropological and historical—and with the microcosm—embryologic and psychological—, and having verified the utter precision of the forecasts, both in terms of the chronology of the cycles and their content—matching the hierarchy of the *chakras*—, it is obvious that we cannot talk of

“fortuity”. It does not have anything to do with chance, and we can categorically state that there is something fishy going on in Evolution.

From the materialistic paradigm, all of this seems inconceivable. It does not coincide at all with many of the core dogmas of official science. However, the facts are there and it is not possible to ignore the evidence. From this platform, I invite anyone that wishes to do so to seek an explanation to this massive avalanche of closely coordinated chained “coincidences” in diverse fields.

Let us now telegraphically outline our “philosophical” proposal so as to understand the ultimate significance of all that we have discussed so far.

All manifested reality appears, inextricably, in the form of dualities. No form of expression is possible outside this play of the opposites. We cannot find sound without silence, subject without object, inside without outside, and so on. All opposites are mutually dependent and therefore we can understand them as polar manifestations of a reality that transcends them and that is “prior” to this duality itself.

In the various graphs that we have used, for example Fig. 7-A and 7-B, we can see how the course of evolution starts at a pole of maximum energy (and practically no consciousness at all) and ends at another pole of maximum consciousness (and practically null energy). Physicists talk about an infinite potential energy amidst the original quantum void, while sages talk about a clear infinite consciousness in the final mystical void. We propose that these two voids are the same and unique Void, perceived by physicists objectively and by contemplative people subjectively, which in itself, is neither objective nor subjective, but “prior” to that dual perspective. And the most fascinating thing of all is that this Void is not a distant metaphysical reality, but the simple and pure Self-evidence of each and every present moment.

As there is no separation between subject and object in this Self-evidence, it is not possible *see it*, because there is not “anything” that could be seen by “someone”, but neither is it “nothing”, because in fact all things in the universe —both objective and subjective— are mere partial and relative forms of this Self-evidence. And although it is, therefore, unutterable, unexplainable, we may point to It, talking about the empty, self-luminous plenitude.

In order to be able to “see” Self-Evidence, it needs to polarize Itself, at least apparently in subject and object, the same as 0 may become dual in +1 and -1 without changing, other than formally, its absolute value. We say this because our ultimate proposal is that, in order for Self-Evidence to contemplate Itself, it apparently splits in two poles: the original (basically, energy) and the final (basically, consciousness), generating an illusory distance among them which, on vibrating —like the guitar string in our hypothesis— gives rise to a whole scale of harmonics, which are precisely the levels of stability that create the evolutionary cycles that we have discussed here which span the entire range, from the most basic —of enormous energy and little consciousness—to the highest —of little energy and enormous consciousness—, that harmoniously channel the so-called game of chance. (Note the parallelism between the hypothesis we are proposing here and “superstring theory”, although the scope of application in our case is not simply reduced to the world of microphysics, but embraces the entire spectrum of reality).

If we see the things from this perspective, the entire avalanche of “coincidences” that we have revealed here, which are totally unacceptable for the materialistic worldview, are shown to be natural manifestations of That-Which-Is. Or the teleological character of evolution, so denigrated by official science, is understood here as the logical expression of the fundamental structure of what is Real. Or the progressive emergence of consciousness, which is often completely forgotten in many branches of sciences, is presented in our non-dualistic approach as a simple appearance of the infinite lucidity of the ever-present Self-Evidence. Is it not time already to change the paradigm?

Fondest regards to all,

José

P.S. A first approach of the hypothesis presented here was published in 1993 by the journal of general evolution *World Futures* Vol. 36, pp. 31-56, edited by Ervin Lazlo under the title *A hypothesis on the Rhythm of Becoming*.

Three years later, Ed. Kairós edited and published a new corrected and expanded version of the same hypothesis under the title *Entre la evolución y la eternidad (Between Evolution and Eternity)* in which it emphasized its inclusion in the new sciences of Evolution.

In 2008, Ed. Dilema published another paper entitled *Siendo nada, soy todo (Not being anything, I am everything)* in which I attempted to study the ultimate implications of the hypothesis from the viewpoint of perennial philosophy and the non-dualistic mystics.

I have recently made some adjustments to the periodic table of our hypothesis that have generated new confirmations of its validity, and therefore we think that it is convenient to offer it to the general public. And here it is... *Beyond Darwin*.

### **Addendum 1: Coincident research**

Some readers of the present article have raised doubts as to whether the sequence of evolutionary and historical cycles we have presented here may not have been somewhat forced to make it coincide with the forecasts of our hypothesis. On our part, we think that the series of selected milestones, grouped together in the form of blocks (Palaeontology –Kingdom: animal, Phylum: Chordata, Class: Mammals, Order: Primates, Superfamily: Hominoids, Family: Hominids, and Genus: *Homo*–, Palaeoanthropology –*H. habilis*, *H. erectus*, *Archaic H. sapiens*, *H. sapiens* and *H. sapiens sapiens*– and History –Neolithic, Ancient Age, Middle Ages, Modern Age and Postmodern Age–), is solid and coherent enough for there to be no kind of trick or manipulation involved. Nonetheless, in order to clarify any doubts, we shall now attempt to confirm our proposal by presenting some key points in the work of three researchers who have analyzed the phenomenon of evolutionary acceleration independently and from different perspectives –Russian astrophysicist Alexander D. Panov, French palaeontologist Jean Chaline and American computer scientist Carter V. Smith–, whose proposals are fully in tune with the pattern of rhythms we have outlined in this article. Let us see.

**Alexander D. Panov** repeatedly treats the subject in a number of studies. The information we shall contribute here is specifically taken from a couple of articles of his that can be consulted on the Internet. One is entitled: “¿Punto de bifurcación evolutivo?” (Evolutionary Bifurcation Point?) (published in Spanish by LeonAlado.org), and the other: “*Scaling Law of the Biological Evolution and the Hypothesis of the Self-Consistent Galaxy Origin of Life*”.

Panov holds that the evolution of the Earth’s biosphere has passed through a series of stages with phase transitions between them, which he calls biosphere revolutions. He lists a sequence of 19 such revolutions, indicating their approximate dates and their main features. (At each stage, we in turn will indicate the correspondence of each one of these with our pattern of cycles). Let us see the complete list:

**0.** 3,800 million years ago. Emergence of life on Earth / Prokaryotes. [Period leading up to the 1st node of cycle A-1]

**1.** 1,500 million years ago. Oxygen crisis / Aerobic lifeforms / Eukaryotes / Neoproterozoic revolution. [Period leading up to the 2nd node of cycle A-1]

**2.** 590/510 million years ago. Palaeozoic Era begins / Cambrian explosion / Vertebrates. [Period leading up to the 2nd node of cycle A-2]

**3.** 235 million years ago. Mesozoic begins / Revolution of reptiles. [Period leading up to the 2nd node of cycle A-3]

**4.** 66 million years ago. Cenozoic Era begins / Revolution of mammals and birds. [Period leading up to the 2nd node of cycle A-4]

**5.** 25/20 million years ago. The Neogene period begins / Hominoid revolution. [Period leading up to the 2nd node of cycle A-5]

**6.** 5/4 million years ago. The Anthropogene period begins / Quaternary era / First hominids appear. [Around the 2nd node of cycle A-6]

**7.** 2/1.6 million years ago. Olduvai / *Homo habilis* / Palaeolithic revolution. [Around the 2nd node of cycle A-7]

**8.** 0.7/0.6 million years ago. Shell / *Homo erectus* / Settlement of Europe and Asia. [Around the 2nd node of cycle B-1]

**9.** 0.4/0.22 million years ago. Achel / Archaic *Homo sapiens*. [Stage between the nodes of cycle B-2]

**10.** 150/100 thousand years ago. Mustie / *Homo sapiens* / Cultural revolution of the Neanderthals. [Stage between the nodes of cycle B-3]

**11.** 40 thousand years ago. Revolution of the Upper Palaeolithic / *Homo sapiens sapiens* / Cultural revolution of the Cro-Magnons. [Stage between the nodes of cycle B-4]

12. 12/9 thousand years ago. Neolithic revolution. [Period leading up to the 2nd node of cycle B-5]
13. 4000/3000 BC. Revolution of cities / Ancient Age begins. [Around the 1st node of cycle B-6]
14. 800/500 BC. Revolution of the axial era / Iron Age / Age of Empires. [Around the 2nd node of cycle B-6]
15. 400/600 AD. The Middle Ages begin. [Around the 1st node of cycle B-7]
16. 1450/1550 AD. First Industrial Revolution / Modern Age begins. [Period leading up to the 1st node of cycle C-1]
17. 1830/1840 AD. Second Industrial Revolution / Steam engine and electricity. [Period leading up to the 2nd node of cycle C-1]
18. 1950 AD. Computer science revolution / Post-Industrial Age begins. [Period leading up to the 1st node of cycle C-2]

We thus see that of the 19 biosphere and historical revolutions posited by Panov, 13 coincide fully with the rhythm of the cycles of our hypothesis, while the remaining 6 revolutions fully fit in with the pairs of nodes of 3 of our other cycles [“prokaryotic - eukaryotic” in cycle A-1, “urban revolution - axial revolution” (Ancient Age) in cycle B-6 and “first industrial revolution - second industrial revolution” (Modern Age) in cycle C -1], which Panov considered separately. We can therefore say that the coincidence is almost complete and, therefore, given that the research was carried out completely independently, we believe the circumstance to be truly significant and decisive.

**Jean Chaline**, in the paper entitled “*L’arbre de la vie a-t-il une structure fractale?*” (jointly authored by Laurent Nottale and Pierre Grou and also freely available on the Internet), studies the time sequences of the great evolutionary leaps in the global tree of life. In Table I (and Figure 1), he summarizes the list of dates and features of these leaps up until the appearance of primates, while, in Table IV (and Figure 6), he goes on to list the major transformations that have occurred throughout the process of humanization of primates. The combined series would thus be something like as follows:

1.  $3,500 \pm 400$  million years ago. Emergence of life / First prokaryotic cells. [Period leading up to the 1st node of cycle A-1]
2.  $1,750 \pm 250$  million years ago. First eukaryotic cells. [Period leading up to the 2nd node of cycle A-1]
3.  $1000 \pm 100$  million years ago. Multicellularity. [Period leading up to the 1st node of cycle A-2]
4.  $570 \pm 30$  million years ago. Exo-skeletons. [Period leading up to the 2nd node of cycle A-2]

5.  $380 \pm 30$  million years ago. Tetrapods / First tetrapod with lungs. [Period leading up to the 1st node of cycle A-3]
6.  $220 \pm 20$  million years ago. Homeothermy / First mammals. [Period leading up to the 2nd node of cycle A-3]
7.  $120 \pm 20$  million years ago. Viviparity / First marsupials and placentals. [Period leading up to the 1st node of cycle A-4]
8.  $65 \pm 5$  million years ago. First primate / Prosimians. [Period leading up to the 2nd node of cycle A-4]
9.  $40 \pm 5$  million years ago. First anthropoid ancestor / Simians. [Period leading up to the 1st node of cycle A-5]
10.  $20 \pm 2$  million years ago. Proconsul / Apes. [Period leading up to the 2nd node of cycle A-5]
11.  $10 \pm 1.5$  million years ago. Common ancestor P/G/H. [Around the 1st node of cycle A-6]
12.  $5 \pm 1$  million years ago. Australopithecus. [Around the 2nd node of cycle A-6 or around the 1st node of cycle A-7]
13.  $2 \pm 0.3$  million years ago. First *Homo*. [Around the 2nd node of cycle A-7]
14.  $0.18 \pm 0.02$  million years ago. Modern man / *Homo sapiens*. [Period leading up to the 1st node of cycle B-3]

We thus see that the first 13 evolutionary leaps that appear in this list correspond accurately, one by one, with all the nodes in our series A, except for number 12, which includes the 2nd node of cycle A-6 and the 1st node of cycle A-7. We can therefore affirm that the coincidence is once again practically complete. It is therefore not surprising that when the Chaline calculates the ratio between the durations of successive stages, he obtains an average value which, as he himself states –in his article “*La relativité d’échelle dans la morphogenèse du vivant: fractal, déterminisme et hasard*”–, seems to be, both generally and comprehensively, near to the square root of 3 ( $1.736 \pm 0.013$ ), which is completely in tune with our proposal, since, given that each one of our cycles has two nodes, applying this number ( $\sqrt{3}$ ) twice, we obtain:  $\sqrt{3} \times \sqrt{3} = 3$ , which, as we recall, is precisely and exactly the ratio between the durations of the successive cycles in our hypothesis! Can anyone believe that all this is coincidence?

**Carter V. Smith** has comprehensively studied the phenomenon of evolutionary acceleration on his two web pages: “*Twelve Stage Vision*” and “*Accelerating Evolution*”. From an integral perspective, he outlines a model of 12 grouped stages, three by three, in four eras –Body, Emotion, Mind and Spirit–, which reveals the exponential acceleration of human evolutionary development. We shall now summarize the entire series, which includes the approximate duration of each stage, in powers of 10, its main feature and the respective correlation with the cycles of our hypothesis:



**S1.** Since the origin of the universe to 5,000 million years ago. Matter / Big Bang → organic matter. [From the Big Bang to the origin of cycle A-1]

**S2.** From 5,000 to 500 million years ago. Cells / Organic matter → vertebrates. [From the origin of cycle A-1 to the origin of cycle A-3]

**S3.** From 500 to 50 million years ago. Animals / Vertebrates → simians. [From the origin of cycle A-3 to the origin of cycle A-5]

**S4.** From 50 to 5 million years ago. Mammals / Prosimians → Australopithecus. [From the origin of cycle A-5 to around the origin of cycle A-7]

**S5.** From 5 to 0.5 million years ago. Hominids / Australopithecus → *Homo erectus*. [From around the origin of cycle A-7 to around the 1st node of cycle B-2]

**S6.** From 500,000 to 50,000 years ago. Archaic man / *Homo erectus* → *Homo sapiens sapiens*. [From around the 1st node of cycle B-2 to around the 1st node of cycle B-4]

**S7.** From 50,000 to 5,000 years ago. Magic / *Homo sapiens sapiens* → Ancient Age. [From around the 1st node of cycle B-4 to around the 1st node of cycle B-6]

**S8.** From 5,000 to 500 years ago. Mythical / Middle Ages → Modern Age. [From around the 1st node of cycle B-6 to around the 1st node of cycle C-1]

**S9a.** From 500 years ago. Rational-individualistic.

**S9b.** Currently emerging. Rational-pluralistic.

**S9c.** In the near future. Rational-integral.

**S10.** Integral-spiritual, **S11.** Subtle-spiritual and **S12.** Causal-spiritual will unfold in an accelerated way during the next century and a half.

We thus see that each of the stages that Smith proposes includes, time and time again and in all cases, two complete cycles of our pattern of time. For that reason, as the duration of each cycle in our hypothesis is exactly one third of that of the previous one, if we consider stages that comprise a couple of these cycles –as Smith does–, the ratio between their durations will be:  $3 \times 3 = 9$ , which is obviously very close to 10, the value this American researcher uses in an approximate way, in his evolutionary scheme. Once again, therefore, there is practically complete coincidence between the evolutionary path outlined in “Twelve Stage Vision” and our hypothesis, and it is no wonder Smith situates the end stop –Omega– of the evolutionary spiral around the year 2150, not very far from our 2217.

In conclusion, given the enormous coincidences between the investigations of Panov, Chaline, Smith and my own, all carried out independently and from very different approaches, it seems evident that we have unexpectedly discovered a very precise evolutionary pattern within the apparently random dynamics of the universe. It is obvious, therefore, that, given the scope and profound implications of this discovery, a host of novel perspectives now open up. So from here, as we stated in the Introduction,

all readers are invited to investigate the suggestive paths that are beginning to appear. We may thus possibly discover that the reality is much more fascinating than we could ever have imagined.

## **Addendum 2: Further coincident research**

When I started to develop this evolutionary hypothesis back in the early 1980s, it was truly upsetting to realize the utter solitude in which I found myself. I felt I had discovered something truly valuable and yet could not find others with whom to share the discovery and compare opinions. There were times when I was even tempted to throw in the towel. Repeatedly, however, the intuition that what I had found was worth the effort gave me strength to keep working on it.

In recent years, though, the picture has changed completely thanks to the enormous possibilities offered by the Internet. It has been a wonderful surprise and great joy for me to repeatedly find references to numerous authors who, from very different perspectives, put forward very similar ideas to those I had been proposing for many years. To highlight these obvious similarities between research carried out from very different fields, we shall next present a chart (Fig. 10) which aims to summarize the proposals of a significant number of authors who have studied this clamorous phenomenon of evolutionary acceleration, in line with our own work.

This chart will naturally include the three researchers cited in the previous Addendum – **Alexander Panov**, **Jean Chaline** and **Carter Smith**–, as well as the other two –**André de Cayeux** and **Ervin Laszlo**– cited in our article. We shall also include the proposals by the Greek physicist and futurist **Theodore Modis**, author of the article entitled *Forecasting the Growth of Complexity and Change*; the North American electrical engineer **Richard L. Coren**, author of *The Evolutionary Trajectory*; the American engineer, inventor and futurist **Ray Kurzweil**, author of *The Singularity is Near*; the Swedish software engineer **Nick Hoggard**, author of *Evolution and the Feigenbaum Number*; and that of the Spanish biologist **Miguel García Casas**, author of *Teoría de la vida embarazada y la reprobolución* [Theory of Pregnant Life and Reproevolution].

It is truly wonderful to see the myriad similarities between the lists of the major evolutionary milestones proposed in all these works, to the degree that the charts that represent them –whether linear or logarithmical– are virtually identical in all cases. There is just a very slight difference –of only one or two centuries– regarding the date of the final pole towards which the trajectories lead. Yet what are a hundred or two hundred years after a journey of more than 13,500 million years?

Clear differences of opinion do exist among these authors, however, concerning the valuation of this final pole of infinite evolutionary acceleration. From our point of view, it is a “singularity” of the same calibre as that of the initial instant of the Big Bang. If this original pole basically consisted in an *explosion* in the field of “energy”, the final pole towards which we are precipitously heading will essentially consist in an *implosion* in the field of “consciousness”. Note, however, as stated in the last paragraph of this article, both aspects –“energy” and “consciousness”– are not two different realities, but polar aspects of one and the same unique Emptiness, the objective and subjective

A	...	J.D. FAIXAT	A. PANOV	C. SMITH	J. CHALINE	A. DE CAYEUX	E. LASZLO	T. MODIS	R. COREN	R. KURZWEIL	N. HOGGARD	M.G. CASAS
		BIG BANG ...	...	(BIG BANG) MATTER (ORGANIC MOLECULE)	...	...	...	BIG BANG ...	BIG BANG ...	...	BIG BANG ...	...
		ORGANIC MOLECULE						SOLAR SYSTEM				
A-1	1st NODE	PROKARYOTES (KINGDOM: ANIMAL)	PROKARYOTES		PROKARYOTES			FIRST LIFE	PROKARYOTIC LIFE	LIFE	SELF REPRODUCING FORMS OF LIFE	PROKARYOTES
	2nd NODE	EUKARYOTES	EUKARYOTES	CELLS	EUKARYOTES					EUKARYOTES		EUKARYOTES
A-2	1st NODE	MULTICELLULAR LIFE (PHYLJLM: CHORDATE)	(CAMBRIAN EXPLOSION) VERTEBRATES	(VERTEBRATES)	MULTICELLULARITY EXO-SKELETONS			FIRST MULTICELLULAR LIFE	EUKARYOTIC RADIATION	CAMBRIAN EXPLOSION	SEXUAL REPRODUCTION	MULTICELLULAR COELOMATES FISHES
	2nd NODE	VERTEBRATE FISH						CAMBRIAN EXPLOSION				
A-3	1st NODE	REPTILES	REVOLUTION OF REPTILES	(VERTEBRATES)	TETRAPODS			FIRST MAMMALS	APPEARANCE OF CLASS MAMMALIA	REPTILES	MAMMALS	AMPHIBIANS
	2nd NODE	PRIMITIVE MAMMAL			HOMEOTHERMY			FIRST MAMMALS		CLASS MAMMALIA		REPTILES
A-4	1st NODE	P. PLACENTALS	REVOLUTION OF MAMMALS	ANIMALS	VIVIPARITY							MAMMALS
	2nd NODE	(ORDER: PRIMATE)		(PROSIMIANS)	PROSIMIANS							
A-5	1st NODE	MONKEY	REVOLUTION OF HOMINIDS		SMIANS				APPEARANCE OF SUPERFAMILY HOMINOIDEA	ORDER PRIMATE	PRIMATES	PROSIMIANS
	2nd NODE	(SUPERFAM.: HOMINOID)			GREAT APES COMMON ANCESTOR PIGH					SUPERFAMILY HOMINOIDEA		MONKEYS
A-6	1st NODE	HOMINIDAE	REVOLUTION HOMINIDS	MAMMALS					APPEARANCE OF FAMILY HOMINIDAE	FAMILY HOMINIDAE		PONGIDS
	2nd NODE	(FAMILY: HOMINID)										
A-7	1st NODE	AUSTRALOPTHECUS (GENUS: HOMO)	PALEOLITHIC REVOL. HOMO HABILIS	(AUSTRALOPTHECUS)	AUSTRALOPTHECUS			FIRST STONE TOOLS	APPEARANCE OF GENUS HOMO	BIPEDAL ANCESTOR	HOMO HABILIS	AUSTRALOPTHECINES
	2nd NODE	HOMO HABILIS		HOMINIDS	FIRST HOMO					GENUS HOMO		
B-1	1st NODE	(I.L. MODE 1)	HOMO ERECTUS			INITIAL LITHIC CULTURE		DEVELOPMENT OF SPEECH		SPOKEN LANGUAGE		HOMO ERECTUS
	2nd NODE	HOMO ERECTUS										
B-2	1st NODE	(I.L. MODE 2)	ARCHAIC H. SAPIENS	(H. ERECTUS)		CHELLEAN ACHEULEAN		DISCOVERY OF FIRE	APPEARANCE OF ARCHAIC HOMO SAPIENS		ARCHAIC HOMO SAPIENS	
	2nd NODE	ARCHAIC H. SAPIENS		ARCHAIC MAN	HOMO SAPIENS							
B-3	1st NODE	(I.L. MODE 3)	HOMO SAPIENS (REV. OF NEANDERTHALS)			LEVALLOISIAN MOUSTERIAN		EMERGENCE OF "MODERN HUMANS"				H. SAPIENS NEANDERTHAL
	2nd NODE	HOMO SAPIENS (REV. OF NEANDERTHALS)										
B-4	1st NODE	(I.L. MODE 4)	H. SAPIENS SAPIENS (REV. OF CROMAGNONS)	(H. SAPIENS SAPIENS)		AURIGNACIAN MAGDALENIAN	NOMADIC HUNTER-GATHERER SOCIETY	ROCK ART	APPEARANCE OF H. SAPIENS SAPIENS	HOMO SAPIENS	HOMO SAPIENS SAPIENS	HOMO SAPIENS SAPIENS
	2nd NODE	H. SAPIENS SAPIENS (REV. OF CROMAGNONS)		MAGIC								
B-5	1st NODE	(I.L. MODE 5)	NEOLITHIC REV.			MESOLITHIC POLISHED STONE	AGROPASTORAL SOCIETY SETTLEMENTS	AGRICULTURE	DEVELOPMENT OF COMMUNAL VILLAGES	ART		
	2nd NODE	MESOLITHIC NEOLITHIC					AGRICULTURAL SOCIETY	WRITING	DEVELOPMENT OF WRITING	AGRICULTURE	FIRST CIVILIZATION	
B-6	1st NODE	CIVILIZATION (ANCIENT TIME)	REVOLUTION OF CITIES	(ANCIENT AGE)		METAL AGES		DEMOCRACY		WRITING		
	2nd NODE	AXIAL AGE	REV. OF AXIAL ERA	MYTHICAL						CITY-STATES		
B-7	1st NODE	PATRISTICISM (MIDDLE AGES)	MIDDLE AGES				PRE-INDUSTRIAL FEUDAL SOCIETY	CHRISTIANITY				
	2nd NODE	SCHOLASTICISM					INDUSTRIAL SOCIETY	GUNPOWDER	DEVELOPMENT OF PRINTING	PRINTING	FIRST TECHNOLOGICAL REVOLUTION	
C-1	1st NODE	EMPIRICISM (MODERN AGE)	1 <sup>ST</sup> INDUSTRIAL REV.	(MODERN AGE)		RENAISSANCE MACHINISM	INDUSTRIAL SOCIETY	RENAISSANCE			INDUSTRIAL REVOL.	
	2nd NODE	POSITIVISM	2 <sup>ND</sup> INDUSTRIAL REV.	RATIONAL				INDUSTRIAL REVOL.			ELECTRICITY	
C-2	1st NODE	ECOLOGY (POSTMODERN AGE)	COMPUTER SCIENCE REVOLUTION			ATOMIC AGE	POST-INDUSTRIAL SOCIETY	MODERN PHYSICS DNA INTERNET	DEVELOPMENT OF DIGITAL ELECTRONICS	INDUSTRIAL REVOL. ELECTRICITY COMPUTER PERSONAL COMPUTER	INVENTION OF COMPUTER WWW	
	2nd NODE											
C-3	1st NODE			INTEGRAL								
	2nd NODE											
...	...	...	...	...	...	...	...	...	...	...	...	...
Q		YEAR 2217	YEAR 2027	YEAR 2150	YEAR 2050 / 2110	YEAR 2100	...	YEAR 1990	YEAR 2140	YEAR 2045	YEAR 2004	...

FIGURE 10

aspects of ever-present, simple and full Self-evidence. Thus, from our point of view, the “trick” of evolution and of history will be definitively revealed at this forthcoming final instant. That is, the entire trajectory from the Big Bang to today has occurred in this eternal Now that we in fact are. It will thus be made manifest that our life has not been a mere fleeting fragment in the midst of an endless process, but that we have, in fact, always been the pure, timeless Self-evidence in which all worlds have happened, happen and will happen. There has been no “before”. There will be no “after”. There is only Now. Is it not self-evident?

Attention, though! Of course, that final moment will not be a mere subjective experience achieved by some enlightened individuals. As we have seen, there is truly no subjectivity without objectivity, nor individuals truly separated from their universal environment. Therefore, the final experience will be simultaneously interior and exterior, both individual and collective. As it is now. As it has always been. (The following Addendum 3 will outline the evolutionary scenario from this integral approach).

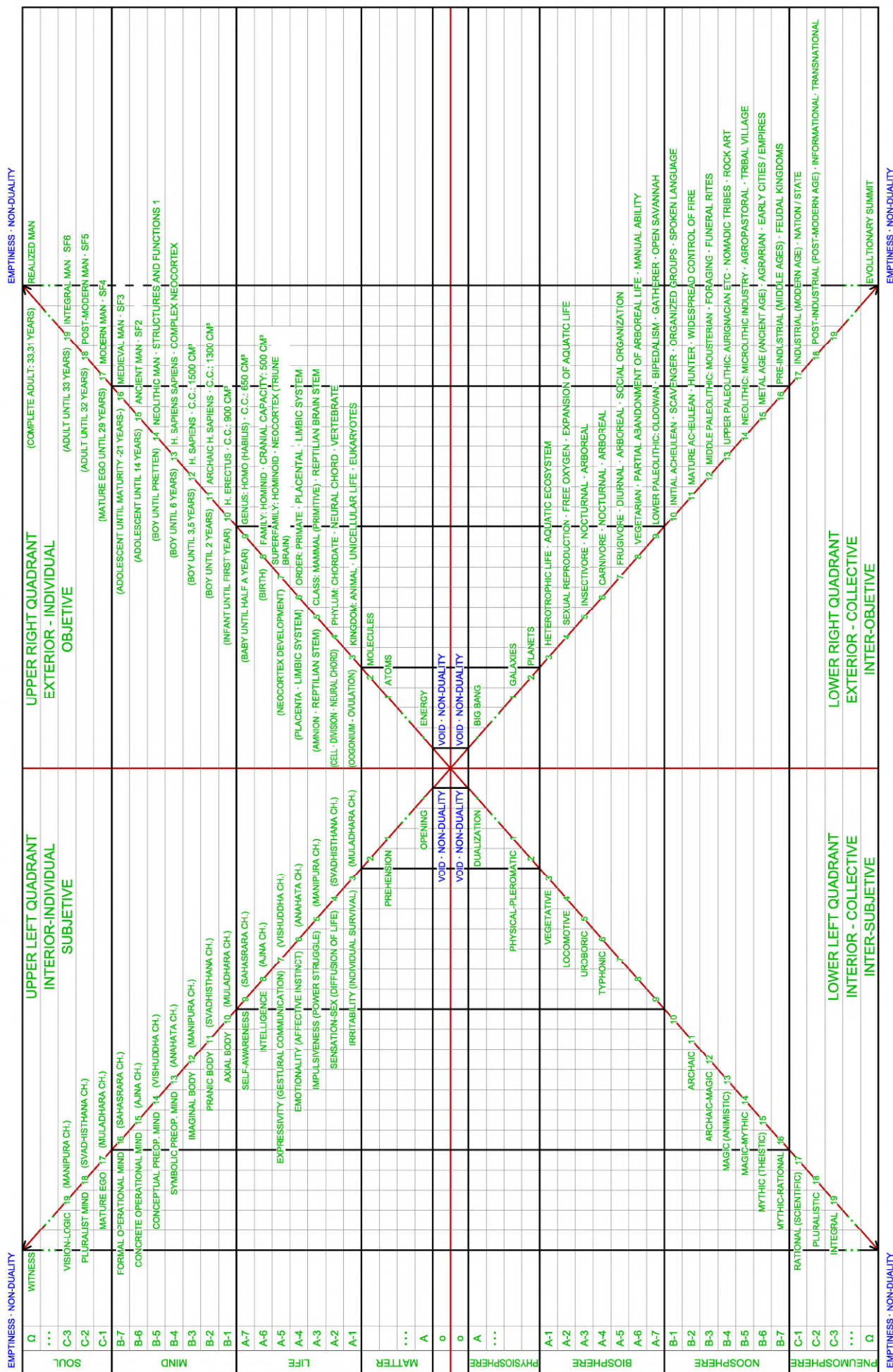
### **Addendum 3: Integral evolution**

Throughout this article, we have analyzed the evolutionary rhythm of both the global “macrocosm” –the human phylogeny– and the individual “microcosm” –our own ontogeny– in their respective and similar trajectories, from the original pole, basically energetic –exterior–, until the final pole, basically conscious –interior–. These four aspects –individual/collective, interior/exterior– have been present in each stage of the evolutionary path, as they all imply one another. None of them could take place without the presence of all the others. Unfortunately, this evidence has not been demonstrated until very recently, while bias and sectarianism have produced a great deal of incomprehension and suffering throughout history.

The great integral thinker Ken Wilber has condensed virtually all of human knowledge in a simple chart that summarizes the entire history of evolution in its four aspects – individual, collective, exterior and interior– of an all-englobing and consistent way. It comprises a simple diagram with four quadrants, in which “individual” aspects are located at the top, “collective” aspects at the bottom, “exterior” aspects on the right and “interior” aspects on the left. Thus, the upper-left quadrant describes the interior-individual process (the conscious self); the upper-right quadrant, the exterior-individual process (the energy organism); the lower-left quadrant, the interior-collective process (the cultural perspective); and the lower right quadrant, the exterior-collective process (the social system).

All the evolutionary levels displayed throughout the history of the universe –the entire energy-consciousness spectrum– are reflected in each of the quadrants according to their specific aspects. In almost all his work, Wilber has placed greater emphasis on the exhaustive study of the interior (psychological and spiritual) spheres. On the other hand, the authors mentioned in the previous Addenda have found it easier to resort to exterior forms when investigating the rhythm of evolution based on paleontological and anthropological data. It seems clear that the integration of both bodies of work can be extremely fruitful for all. We shall thus attempt to express the results of our research in a diagram (Fig. 11) similar to that of Wilber’s four quadrants. We believe that, in this





way, we can provide greater precision in the definition of the levels of the energy-consciousness spectrum.

#### **Addendum 4: Inner evolution**

In Addenda 1 and 2, we have seen the great similarities between our hypothesis regarding the rhythm of evolution and the research of other authors who have also independently studied the surprising phenomenon of evolutionary acceleration from different perspectives. Almost all of these researchers have taken their data from the “objective” or “external” world.

In Addendum 3, we insisted that, in the phenomenal world, “objects” cannot exist without “subjects” or “outside” without “inside”, as both aspects are mutually dependent. Inexorably so.

Therefore, in this Addendum 4 we shall refer specifically to a number of authors who have methodically studied “inner” dynamics, mainly in the field of developmental psychology. This scientific discipline chiefly studies the regularities that occur in the process of psychological development of human beings throughout their life cycle. The specific areas of study can be highly diverse –cognitive, moral, emotional, etc.–, yet in all cases, a detailed description is given of a number of very specific stages which humans sequentially pass through from birth to death given the appropriate circumstances. The existence of these successive stages is not at all mere speculation, but is based on data provided by a major body of research.

We would like to point out here that, as the field of research of developmental psychologists chiefly focuses on the process of human life from birth onward, the spectrum of reality these studies cover is hence restricted to only the last stages of evolution. In principle, it could be thought that this limitation might hinder our attempt to test the hypothesis that we are developing. However, the truth is that the abundance and accuracy of the data we have found has enabled us to carry out the test very easily with very positive results.

To describe the different “lines” or “currents” of development which are the subject of research in this field of psychology, Ken Wilber uses the analogy of a mountain which can be climbed via a number of routes. (We postulate that it is a stratified mountain, like Plank’s “quanta”, Gould and Eldredge’s “punctuated equilibrium” or Mandelbrot’s “fractals”). The landscapes spotted from each of these routes may be very diverse, but in all cases, the paths taken must inexorably pass through successive levels (in our words, strata) to access the summit. That is to say, all the lines or currents of development, each with its specific characteristics, advance along the same altitude gradient, defined by the degree of consciousness, in such a way that the higher the degree of consciousness, the higher the development of a particular line will be.

Wilber posits a graph –a “psychograph”– with the colours of the expanded visible electromagnetic spectrum –from infrared to ultraviolet and beyond– to define the different levels of development. He uses the same psychograph for all lines or currents, since, as already stated all progress through the same altitude gradient. Note, however,

that altitude is simply a measure or a marker of something, yet, in itself, lacks any particular content. Similarly, consciousness, in itself, is not a concrete phenomenon, but the vacuum within which all phenomena emerge. Nor is it a specific line of development among many others, but rather the opening in which all the lines of development unfold. Thus, the degree of consciousness allows us to determine the height at which each of these lines passes at any given time.

As already stated, after analyzing the work of countless researchers of psychological development, Wilber has designed an integral chromatic altimeter that precisely defines the successive general levels through which the different lines pass. For instance, we may speak of orange cognition, an orange sense of identity, an orange vision of the world, etc. Thus, the “chromatic altimeter” shows the general similarities between the different lines or currents of development.

Dear reader, if you have followed what we have been explaining in this article so far, you may have noticed that our basic hypothesis is ultimately no other than a “sound altimeter” of overall evolution and individual development. As you will recall, we stated that, starting from the vibrating unity of original energy-consciousness –the dual appearance of ever-present Self-evidence–, the successive second harmonics generated the entire spectrum of “potential levels of stratified stability” which, as we have shown, channel the entire process of evolution and development. Amazingly, our “sound altimeter” exactly coincides with Ken Wilber’s “chromatic altimeter” in its totality, level by level!!! Wilber’s **infrared** corresponds to our **B-4, magenta** to **B-5, red** to **B-6, amber** to **B-7, orange** to **C-1, green** to **C-2, teal** to **C-3, turquoise** to **C-4, indigo** to **C-5, violet** to **C-6, ultraviolet** to **C-7** and **clear light** to **beyond series C**, i.e. beyond the transpersonal witness. All twelve levels!!! Full house!!!

In Figure 12, we have attempted to show the full correspondence between the stages in human life observed by developmental psychologists and the evolutionary levels proposed in our hypothesis. We have placed our “sound altimeter” on the left side of the chart, Wilber’s “chromatic altimeter” on the right, and the names and areas of study of 15 of the most renowned researchers in human psychological development along the top: **Jean Piaget**, **Michael L. Commons** and **Francis A. Richards** (cognitive), **Jean Gebser** and **Ken Wilber** (worldviews), **Abraham Maslow** (needs), **Clare W. Graves** and **Jenny Wade** (values), **Don E. Beck** and **Chris Cowan** (spiral dynamics), **Jane Loevinger** and **Susanne Cook-Greuter** (self-identity), **Lawrence Kohlberg** (morals), **James Fowler** (stages of faith) and **Robert Kegan** (orders of consciousness). The solidity of the resulting plot is almost complete. Fundamentally, in the section most investigated by these psychologists (between our steps B-4 and C-3), the coincidence between the stages posited by each of these authors and the levels indicated in the two reference altimeters (sound and chromatic) is overwhelming. It thus seems that our hypothesis passes (how could it not!) the test of “inner development” with honours. We insist: Can anyone honestly think that this is pure coincidence?

To illustrate the rapid emergence of these psychological stages along the course of the evolutionary and historical process, we had intended to use Wilber’s chromatic altimeter. We have encountered, however, the problem of the lack of contrast between the colours representing the successive cycles –magenta, red, amber. etc.–, which makes it difficult to perceive successive phases and interfaces. So, finally, we have chosen to

J. PIAGET (M. COMMONS/ F. RICHARDS)	J. GEBSER (K. WILBER)	A. MASLOW	C. GRAVES	D. BECK C. COWAN (J. WADE)	J. LOEVINGER S. COOK-GREUTER	L. KOHLBERG	J. FOWLER	R. KEGAN	K. WILBER
COGNITIVE	WORLDVIEWS	NEEDS	VALUES	SPIRAL DYNAMICS	SELF-IDENTITY	MORAL	STAGES OF FAITH	ORDERS OF CONSCIOUSNESS	ALTITUDE
B-2 (LOWER PALEOLITHIC)	ARCHAIC	PHYSIOLOGICAL SURVIVAL		SURVIVAL (BEIGE)	SYMBIOTIC	PRE-MORAL	0 UNDIFFERENTIATED	0 INCORPORATIVE	INFRARED
B-3 (MIDDLE PALEOLITHIC)	(ARCHAIC- MAGIC)								
B-4 (UPPER PALEOLITHIC)	MAGIC								
B-5 (MESOLITHIC- NEOLITHIC)	(MAGIC- MYTHIC)	PHYSIOLOGICAL SATISFACTION	MAGIC- ANIMISTIC	KIN SPIRITS (PURPLE)	IMPULSIVE	1 OBEDIENCE AND PUNISHMENT	1 INTUITIVE- PROJECTIVE	1 IMPULSIVE	MAGENTA
B-6 (ANCIENT TIMES)	MYTHIC	SAFETY	EGOCENTRIC	POWER GODS (RED)	SELF-PROTECTIVE	2 SELF-INTEREST	2 MYTHIC-LITERAL	2 IMPERIAL	RED
B-7 (MIDDLE AGES)	(MYTHIC- RATIONAL)	BELONGINGNESS	ABSOLUTISTIC	TRUTH FORCE (BLUE)	CONFORMIST	3 INTERPERSONAL ACCORD	3 SYNTHETIC- CONVENTIONAL	3 INTERPERSONAL	AMBER
C-1 (MODERN AGE)	MENTAL RATIONAL	SELF-ESTEEM	MULTIPLISTIC	STRIVE DRIVE (ORANGE)	CONSCIENTIOUS	4 LAW AND ORDER	4 INDIVIDUAL- REFLEXIVE	4 INSTITUTIONAL	ORANGE
C-2 (POSTMODERN AGE)	(PLURALISTIC)	SELF- ACTUALIZATION	RELATIVISTIC	HUMAN BOND (GREEN)	INDIVIDUALISTIC	5 SOCIAL CONTRACT	5 CONJUNCTIVE	(4.5)	GREEN
C-3	APERSPECTIVIST INTEGRAL		SYSTEMIC	FLEX FLOW (YELLOW)	AUTONOMOUS	6 PRINCIPLED CONSCIENCE	6 UNIVERSALIZING	5 INTERINDIVIDUAL	TEAL
C-4	(PARADIGMATIC)			GLOBAL VIEW (TURQUOISE)	INTEGRATED				TURQUOISE
C-5	(CROSS-PARADIGMATIC)	(SELF- TRANSCENDENCY)		(TRANSCENDENT)	CONSTRUCT-AWARE				INDIGO
C-6				(UNITY)	EGO-AWARE				VIOLET

FIGURE 12



use the colours suggested in Spiral Dynamics, as in this case, cool tones alternate with warm, so the graph presents greater contrast and is therefore more expressive and clarifying. Obviously, the drawing is also applicable to any other line of development ... but without colours.

Let us then first outline a basic understanding of this transdisciplinary (bio-psycho-social-cultural) model of Spiral Dynamics, which has major similarities with our proposal. Subsequently, as already stated, we shall graphically express these correlations in Figure 13. Finally, we shall draw a very suggestive conclusion from all this.

Spiral Dynamics is rooted in the long-standing and thorough research of professor of psychology Clare W. Graves into the evolution of individuals and societies. Analyzing the different ways of thinking and ways of being of human beings, he identified a number of common patterns or basic value systems and integrated them into a multi-layered model of progressively complex levels. Graves held that the nature of human beings is an open system in constant evolution which advances by quantum leaps from a stationary state to another through a hierarchy of ordered, relatively stable systems, which unfurl spirally over the entire historical process of humankind from its beginnings to the present. He posited that these emergent stages are not rigid steps, but rather flowing, overlapping and interrelated waves, leading to the expansive spiral dynamics of individual and collective development, driven by their own internal dynamics and changing conditions of life. As it possesses a broader perspective and a more complex capacity for organization, each emergent wave “transcends and includes” –as Wilber puts it– all previous waves, acquires the maximum importance for a period of time and ultimately ends up being “transcended by and included in” a new, broader-ranging and more complex wave.

After Graves’ death, his co-workers Don E. Beck and Chris Cowan continued to develop and corroborate their mentor’s theoretical model and used it as the basis for their book *Spiral Dynamics: Mastering Values, Leadership, and Change*. These authors call the successive paradigms that define each of the eight basic levels of the spectrum “value memes” or “vMememes”. As can be seen in Fig. 12, the eight levels of Spiral Dynamics exactly coincide, one by one, with all the cycles of our hypothesis between B-4 and C-4. It occurred to Beck and Cowan to identify each of these levels with a certain colour, thus facilitating the understanding and dissemination of their intelligent and effective model. The basic characteristics of these levels or colours are as follows:

**Beige:** Survival Instinct. Satisfaction of physiological needs. Impulsiveness. Biological automatism. Immediate action. [Nomadic hordes. “Savagery”.]

**Purple:** Kin Spirits. Loyalty to the chief, the clan, tradition. Ethnocentric culture. Safety. Magic-animistic thinking. Superstitions. Taboos. Rituals to appease ancestral spirits. [Tribal settlements. “Barbarism”.]

**Red:** Power Gods. Egocentric. The grandiose, impulsive, omnipotent Self. Triumph of the strong. Myths of heroes. Fighting. Conquest. Domination. Exploitation. Tyranny. [Ancient empires. “Enslavement”.]

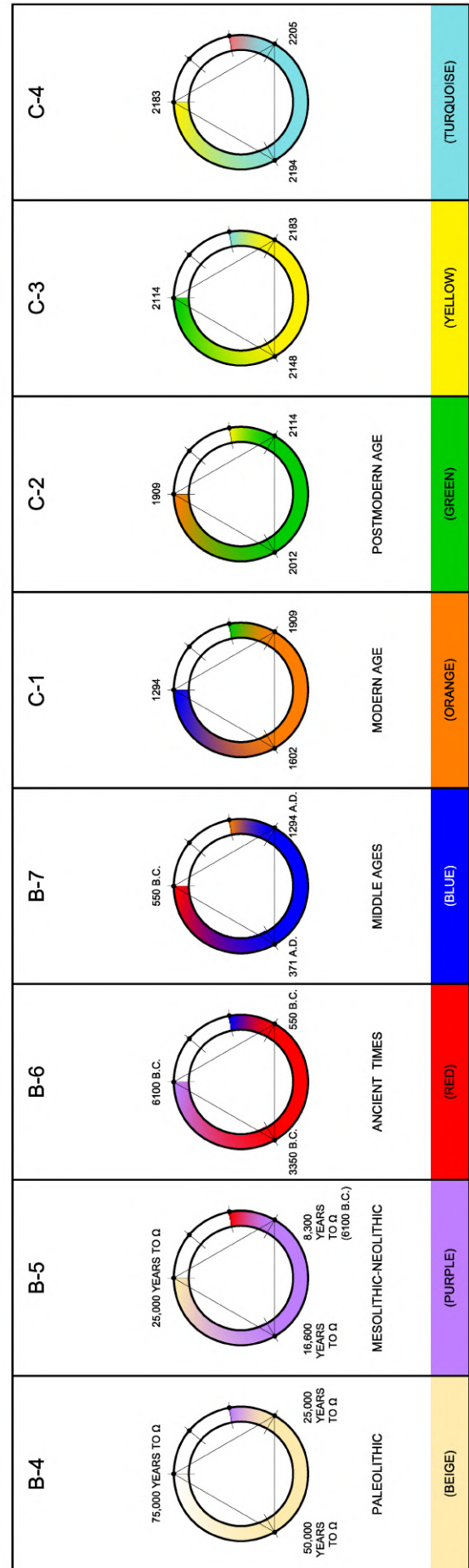
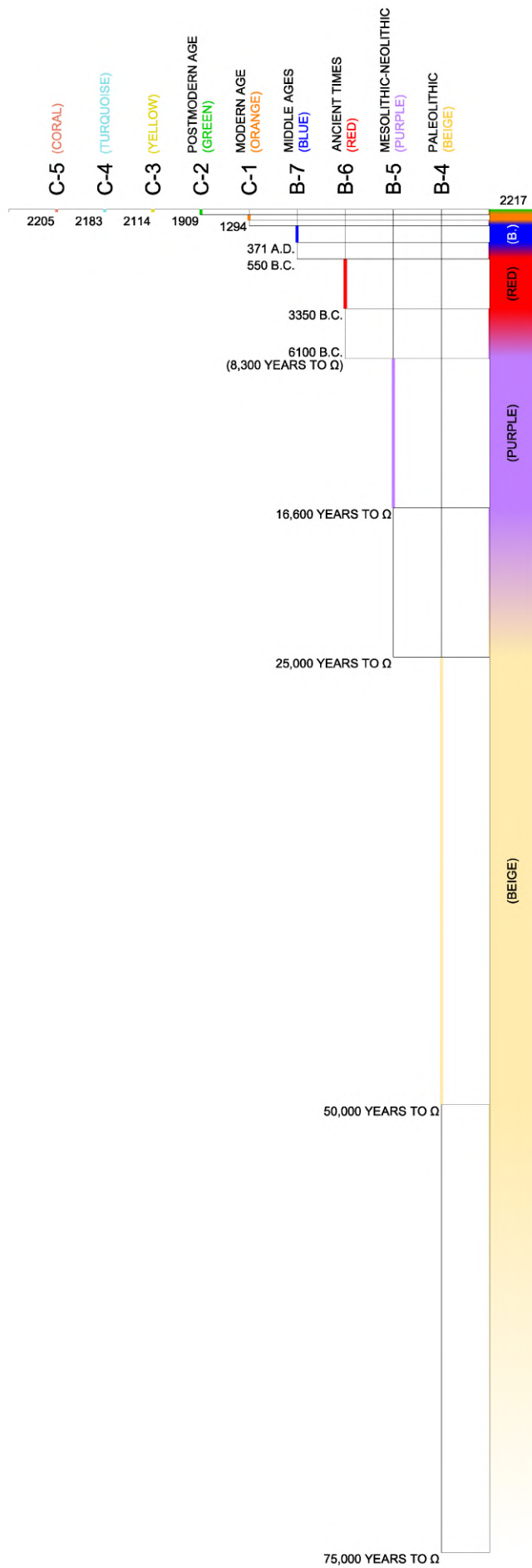


FIGURE 13

**Blue:** Truth Force. Absolutist thinking. Certainty. Existence ordered via a divine code. Regulations. Rules. Traditions. Obedience. Discipline. Guilt. Self-sacrifice. Deferred reward. Order. Stability. Conformism. Socio-centric culture. [Medieval kingdoms. “Feudalism”.]

**Orange:** Strive Drive. Effort. Pragmatism. Empiricism. Positivism. Scientism. Strategy. Competition. Dynamism. Growth. Success. Results. Achievements. Free market. Material goods. Consumerism. Individualism. Autonomy. Control. [National states. “Capitalism”.]

**Green:** Human Bond. Community Collaboration. Solidarity. Associative movements. Building of consensus. Relativism. Pluralism. Multiculturalism. The sensitive Self. Emotional communication. Feelings. Equality. Sense of injustice. Human rights. Feminism. Environmental awareness. Sustainability. Ecology.

**Yellow:** Flex Flow. Process integration. Systemic thinking. Complexity. Interdependence. Collaborative networks. Multiple realities. Open systems. Acceptance of uncertainty. Questioning mentality. Curiosity. Inquiry. Flexibility. Utility. Functionality. Spontaneity.

**Turquoise:** Global View. Global synthesis. Chaordic (chaotic-ordered) world. Fractal reality. Life as an unfolding of holoarchies. Spiral dynamics. Multiple levels interwoven into one conscious system. Communion with the whole. Understanding of universal harmony. Collective consciousness. Holographic connections. Transpersonal mentality. Cosmic spirituality.

Fig. 13 shows the successive vMememes (colours), both individually and collectively, illustrating the historical periods in which each began to emerge (increasing gradation of colour), the stages during which they dominated the collective panorama (continuous colour) and the phases during which their predominance waned (decreasing gradation of colour). The conclusions to be drawn from the graph are evident. On the one hand, we have said that spiral dynamics is expansive and therefore with each twist –transcending and integrating all previous stages–, its level of consciousness and ability to embrace greater complexity increases. On the other hand, we have found that the duration of the successive stages decreases, one after another, at a dizzying rate, and that within a couple of centuries a moment of infinite creativity will thus be reached. At that moment, in that Singularity, consciousness will have transcended and included the entire spectrum of reality and will thus become manifest in the world of forms, the ever-present truth in the timeless Emptiness or Void: the non-duality of energy and consciousness, of object and subject, of origin and end.

Ray Kurzweil, one of the most prestigious researchers of technological acceleration, locates the moment of Singularity in 2045. He states that the non-biological intelligence created in that year will be a thousand million times more powerful than all human intelligence today. However, that does not seem to really be the true evolutionary summit, because, subsequently, in his book *The Singularity Is Near*, he states that our civilization will expand outward, turning all the dumb matter and energy that we comprise into highly intelligent (and transcendent) matter and energy. So, in a sense, we can say that the Singularity will eventually imbibe the universe with its spirit. Kurzweil specifies that we will manage to saturate the universe with our intelligence before the

end of 22nd century and states “Once we saturate the matter and energy of the universe with intelligence, it will ‘wake up’, be conscious, and sublimely intelligent. That’s about as close to God as I can imagine.” Accordingly, it thus seems that the real evolutionary summit will not take place in 2045, but will occur in the late 22nd century, when all the energy and intelligence of the universe will be experienced in a unified way.

Seen in this way, the coincidence with my proposal seems quite clear, in terms of both date and content. As we have posited in this article, at the **beginning of the 23rd century** –around the year 2217– **energy** and **consciousness** will reveal their ultimate non-duality. According to Ray Kurzweil, at the **end of 22nd century**, all the **energy** of the universe will be saturated with intelligence and the Singularity will eventually imbibe this universe with its spirit. Doesn’t that all sound very similar?

#### **Addendum 5: Further coincidences (David J. LePoire)**

I have been fortunate to find recently some articles by American software engineer David J. LePoire, in which he investigates the global pattern of evolution, fundamentally in the fields of energy, the environment and technology. Although his starting point and final forecasts differ from my proposal, the coincidences between our respective analyses of the evolutionary process are truly surprising. Therefore, I do not wish to miss the opportunity to include in these pages at least a reference to these suggestive coincidences with LePoire’s work.

In the initial abstract of his article *Potential nested accelerating returns logistic growth in Big History*, Dave states the following:

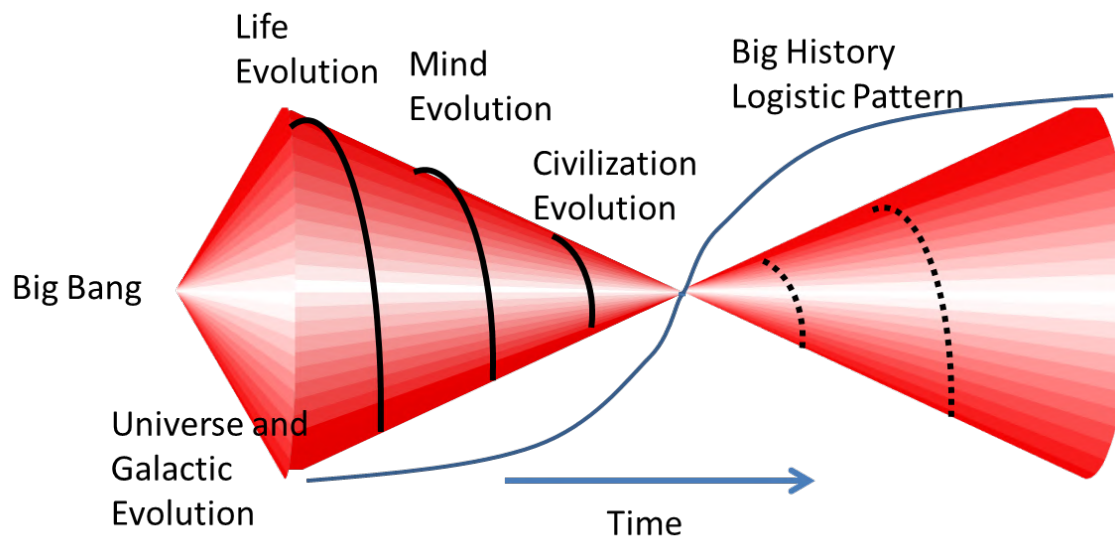
*“The discussions about the trends in rates of change, especially in technology, have led to a range of interpretative models including accelerating rates of change and logistic progress. These models are reviewed and a new model is constructed that can be used to interpret Big History. This interpretation includes the increasing rates of the evolutionary events and phases of life, humans, and civilization. These three phases, previously identified by others, have different information processing mechanisms (genes, brains, and writing). The accelerating returns aspect of the new model replicates the exponential part of the progress as the transitions in these three phases started roughly 5 billion, 5 million, and 5,000 years ago. Each of these three phases might be composed of a further level of about six nested transitions with each transition proceeding faster by a factor of about three with corresponding changes in free energy flow and organization to handle the increased generation rate of entropy from the system. Nested logistic transitions have been observed before, for example in the ongoing exploration of fundamental physics, where the progress so far suggests that the complete transition will include about 7 nested transitions (sets of subfields). The reason for this number of nested transitions within a larger transition is not known, although it may be related to the initial step of understanding a fraction of the full problem.”*

In Table 1, LePoire describes, one by one, the different evolutionary stages, defined by the successive changes in energy flows [I indicate in brackets the correspondence with our evolutionary cycles]: Gravitational [Big Bang], Planet/Life [Formation of the Earth], Complex Cells [A-1], Cambrian [A-2], Mammals [A-3], Primates [A-4],

Hominids [A-6], Humans [A-7], Speech [B-1], Fire [B-2], Ecoadaptation [B-3], Modern Humans [B-4], Agriculture [B-5], Civilization [B-6], Commercial Revolution [B-7], Scientific/Exploration, Industrial [C-1], Information [C-2]. The parallelism is practically total!

Coinciding with our hypothesis, Dave proposes a temporal contraction factor between the successive evolutionary cycles of 3. He states, “*A time contraction factor of about 3 is similar to time and energy contraction factors found by Snooks (2005) and Bejan and Zane (2012). [...] Note that just one time contraction factor was realized from the Big Bang to the beginning of life on Earth.*” He then adds, “*Alexander Panov (2011) also organized evolutionary history with 19 evolutionary crisis transitions with decreasing duration (by about a factor of 3). This is called the scaling law of evolution.*”

In the article *Interpreting Big History as Complex Adaptive System Dynamics with Nested Logistic Transitions in Energy Flow and Organization*, LePoire represents the global dynamics of evolution by means of the following figure:



In the text he states, “*The overall logistic of the Big History might be viewed as consisting of three spirals on one side of a double cone representing the evolution of **life**, **mind** and human **civilization** [see Figure]. Each spiral would consist of six to seven **nested smaller logistic growth phases with time durations decreasing by about a third**. The **astronomical period** before life began (i.e. 13.8 billion to 5 billion years ago) is a factor of **three times the duration represented in the cone**. This period was driven by gravitation and expansion as the universe’s temperature dropped, at first quickly but then slowing down. This can be represented by a cone pointed in the opposite direction. After the inflection point, a reflection in the duration of phases might occur.*” The **bold lettering** is mine].

As can be appreciated, our descriptions of the overall pattern of evolution coincide practically totally. Dave talks about THREE spirals that represent the evolution of life, mind and civilization (recall our three series: “life”, “mind” and “intellect”), with SEVEN stages of smaller logistic growth nested in each one (recall the seven cycles that each of our series encompasses), the temporal duration of each stage being a THIRD of the preceding one (recall the length of 1/3 of our successive second harmonics). Moreover, the astronomical period is THREE times the duration represented by the

three turns of the cone (as we have observed in our research). It is fascinating to see how the aforementioned paragraph by Dave is a perfect summary of the hypothesis we are proposing!

Nonetheless, it would also be appropriate here to add that LePoire's interpretation of the direction of the vertex of the evolutionary spiral differs from the one we are proposing in this book. Instead of foreseeing a final singularity of infinite creativity, as we have done, Dave predicts a simple inflection point in the evolutionary pattern, at which the accelerated process of evolution reverses its direction, thus initiating a gradual slowdown in the rhythm of transformations.

In the article *An Exploration of Historical Transitions with Simple System Dynamics Models*, Dave focuses his research on the six main social and technological transitions of human evolution, i.e. between hunter-gatherers [B-4], agricultural societies [B-5], early civilizations [B-6], market development [B-7], industrialization [C-1] and sustainable societies [C-2]. We have included in brackets the correspondences with our cycles, because, as can be seen, they coincide completely]. He states, "*The more recent periods arrive after shorter durations about 1/3 the time between the transitions. This factor of 3 is also an approximation for changes in accelerating periods for both natural biological evolution and cultural human evolution as well as this human historical revolution heavily influenced by technology*".

LePoire interprets the whole series of evolutionary stages as a chain of nested logistic curves (S), and points out, in each one of them, an "inflection point" –or change of curvature– at which the stage begins its decline at the moment of greatest creativity. These "inflection points" coincide precisely with the "second nodes" in each of our cycles, in which, as we have explained, the old paradigm reaches its peak and then starts to decline as the seed of a new model arises. To visualize these coincidences, we will indicate LePoire's proposals below in three specific cases that he cites in his article *An Exploration of Historical Transitions*:

In the section on "**agricultural societies**", he states in the text: "*The inflection point was about 9,000 years ago*" and Figure 9 clearly illustrates this change of curvature. (Recall that the "second node" of our cycle B-5 took place approximately 8,300 years ago).

In the section on "**early civilizations**", he states in the text, "*The inflection point of this process occurred at about 600 BCE which is known as the Axial Age*", the corresponding figure clearly illustrating this change of curvature. (Recall that the "second node" of our cycle B-6 took place approximately in the year 550 BCE).

In the section on "**industrialization**", he states in the text, "*Analysis of a different set of data show the peak in innovation per capita at around 1900*" and the corresponding figure clearly illustrates this change of curvature. (Recall that the "second node" of our cycle C-1 took place approximately in the year 1910 AD).

It is truly fascinating that the coincidences between our separate investigations not only refer to the overall list of cycles of evolution and history, but also include minor details such as the specific dates of the "inflection points" between these cycles. It is even more fascinating bearing in mind the different perspectives from which our work has been

proposed. We are sure that the reader will be aware of the profound implications of these coincidences.

## **Addendum 6: Toroidal evolution**

Everything written so far has basically focused on unraveling the overall pattern of the evolution of life in the universe, in general, and the human being, in particular. As we have seen, the result of this integral research clashes head on with the predictions of the materialist paradigm of classical science. Surprisingly, however, ground-breaking lines of research have started to appear in recent years in different branches of science — physics, chemistry, biology, neurology, among others— that are clearly in tune with the world view that emerges from our evolutionary research and can hence provide key data capable of explaining this unexpected universal pattern that we are revealing here.

To show this suggestive harmony between different cutting-edge research in distinct fields of science, we will begin this addendum by outlining the fundamental characteristics of the universal dynamics that emerge from our inquiry into the rhythm of evolution. To this end, let us start out from the flat images represented in Figures 7-A and 7-B. These, we recall, summarized the overall pattern of universal evolution and the individual development of the human being from pole A (original energy) to pole  $\Omega$  (final consciousness).

On the vertical axis of these graphs, we represented the entire spectrum of energy-consciousness, from the base —with a maximum of energy and a minimum of consciousness— to the summit —with a minimum of energy and a maximum of consciousness—, with all the range of possible intermediate equilibria between these two fundamental facets of manifested reality, traditionally known as “the great chain of Being” and which can be summarized as the “matter-life-mind-soul-spirit” series. The horizontal axis of these graphs simply reflected the overall temporal scale, both of the universe and of the human being, from the origin (A) to the end ( $\Omega$ ).

Let us recall at this point a couple of ideas that we have discussed previously. We stated that all manifested reality inexorably appears in the form of dualities —there can be no object without subject, no energy without consciousness— and that, as all opposites are mutually dependent, these can be understood as polar manifestations of a reality that transcends them and is “prior” to this dualization. We then argued that the original quantum vacuum posed by physicists and the final mystical void experienced by contemplatives are the same and unique Void, perceived by physicists objectively and by contemplatives in a subjective way, but which, in itself, is neither objective nor subjective, but rather “prior” to this dual perspective. We finally explained that this Void does not allude to a distant metaphysical reality, but to the simple and pure Self-evidence of each present moment, which encompasses in itself all the manifestations of energy and consciousness that are observed in the spatiotemporal universe.

The other idea that we wish to recall here refers to our statement that, as there is no separation between subject and object in the aforementioned Self-evidence and therefore it is not “something” that can be seen by “someone”, in order to manifest itself relatively, it needs to polarize in appearance as subject and object, just as 0 can dualize in +1 and -1 without changing —other than formally— its absolute value. We thus

proposed that, in its attempt to see itself, this Self-evidence apparently dualizes as an original pole (basically of energy) and a final pole (basically of consciousness), thus generating an illusory distance between the two, which, on vibrating —like the guitar string of our hypothesis—gives rise to a whole range of harmonics, which are precisely the levels of stability that the cycles of evolution that we have studied run through. We insist, however, that the presumed temporal distance between both poles is completely illusory, as in fact everything happens in the timeless Now of the ever present Self-evidence.

If we wish to graphically reflect these two ideas in the aforementioned Figures 7-A and 7-B —which, as we have seen, summarize the overall patterns of universal evolution and the individual development of the human being from the A pole of original energy to the  $\Omega$  pole of final consciousness— we need to perform a couple of maneuvers on the flat surface on which we have represented both graphs (see Fig. 14-A).

First, having proposed that energy and consciousness are not two different realities, but rather the objective and subjective aspects of the same and ever present Self-evidence, we should unify the horizontal lines at the bottom and the top of the graph. As we have stated, these respectively represent the levels of maximum energy and maximum consciousness that are one and the same in fundamental reality. To do so, it will suffice to fold the flat surface of the drawing in on itself, aligning the upper line with the lower one, thus obtaining a cylinder (see Fig. 14-B).

Then, having affirmed that the temporal distance between the original moment (A) and the final moment ( $\Omega$ ) is illusory —as everything happens in the timeless Now— we should also unify the vertical lines on the left and the right of the graph. As already stated, these respectively represent the original and final moments of all evolutionary and developmental processes. To do so, once again we will fold our cylinder over onto itself, until the extreme vertical lines coincide, thus obtaining a figure similar to a “doughnut” in which the central hole is reduced to a point without dimensions. It is what is called in geometry a “horn torus” (see Fig. 14-C).

Bearing in mind what we have just explained —taking the guidelines that have been revealed in our research to their ultimate consequences—, everything points towards a fascinating toroidal dynamic of energy-consciousness, both instantaneous and eternal, as the key element for integral comprehension of the universe. According to this scheme, the flows start out from a Center without dimensions —in its facet A—, follow a spiral path —divergent vortex—, reach the external surface of the torus, and return to the same Center —in its facet  $\Omega$ — via another spiral —convergent vortex—, to subsequently restart its endless process from there. Next, we will try to outline the fundamental aspects of this dynamic that is beginning to be glimpsed, as we are possibly on the verge of solving many of the enigmas and blind alleys in which official science and its obsolete materialistic paradigm are trapped.

From the outset, it is crucial to understand the ultimate meaning of the central point of the “horn torus” that we are proposing, as it is where the germ of everything else lies. As we have seen, this center is deduced, on the one hand, from the unified understanding of the infinite potential energy of the quantum vacuum and the unlimited pure consciousness of the mystical void, and, on the other, from the perception of the illusory character of time and hence of the absolute simultaneity of the original pole (A)



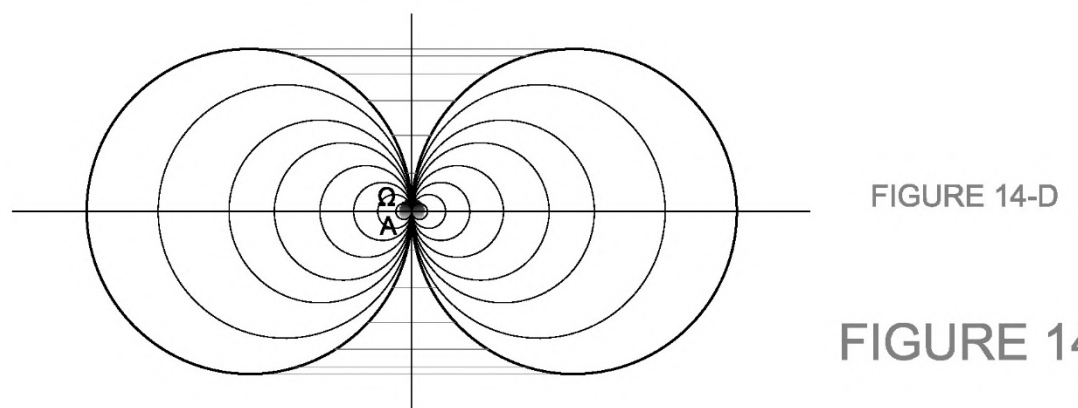
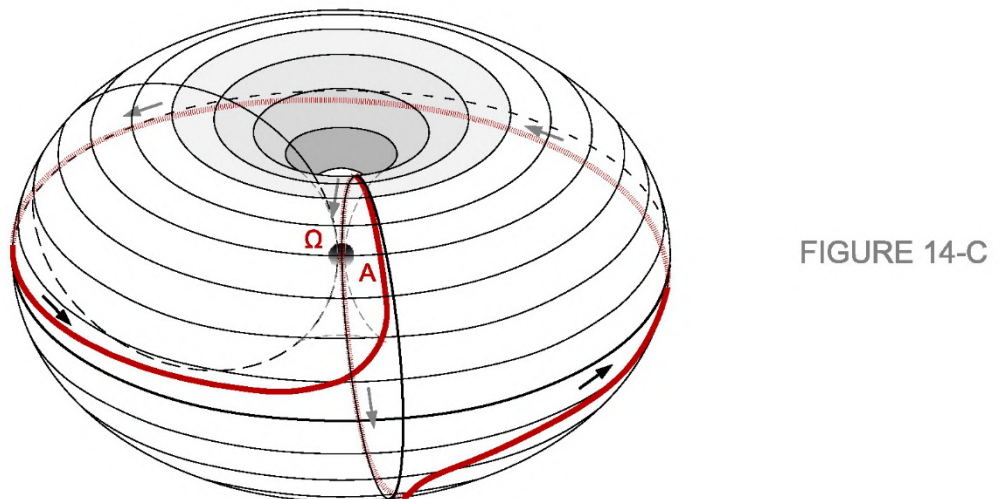
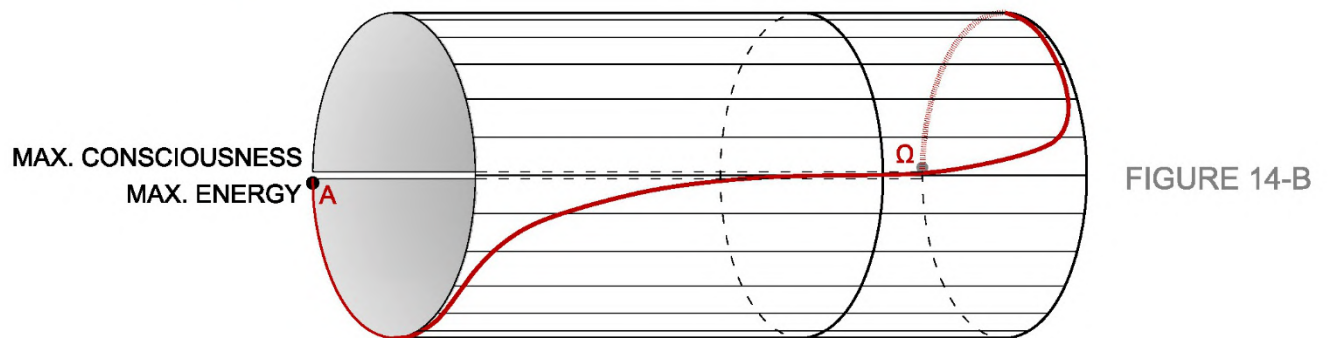
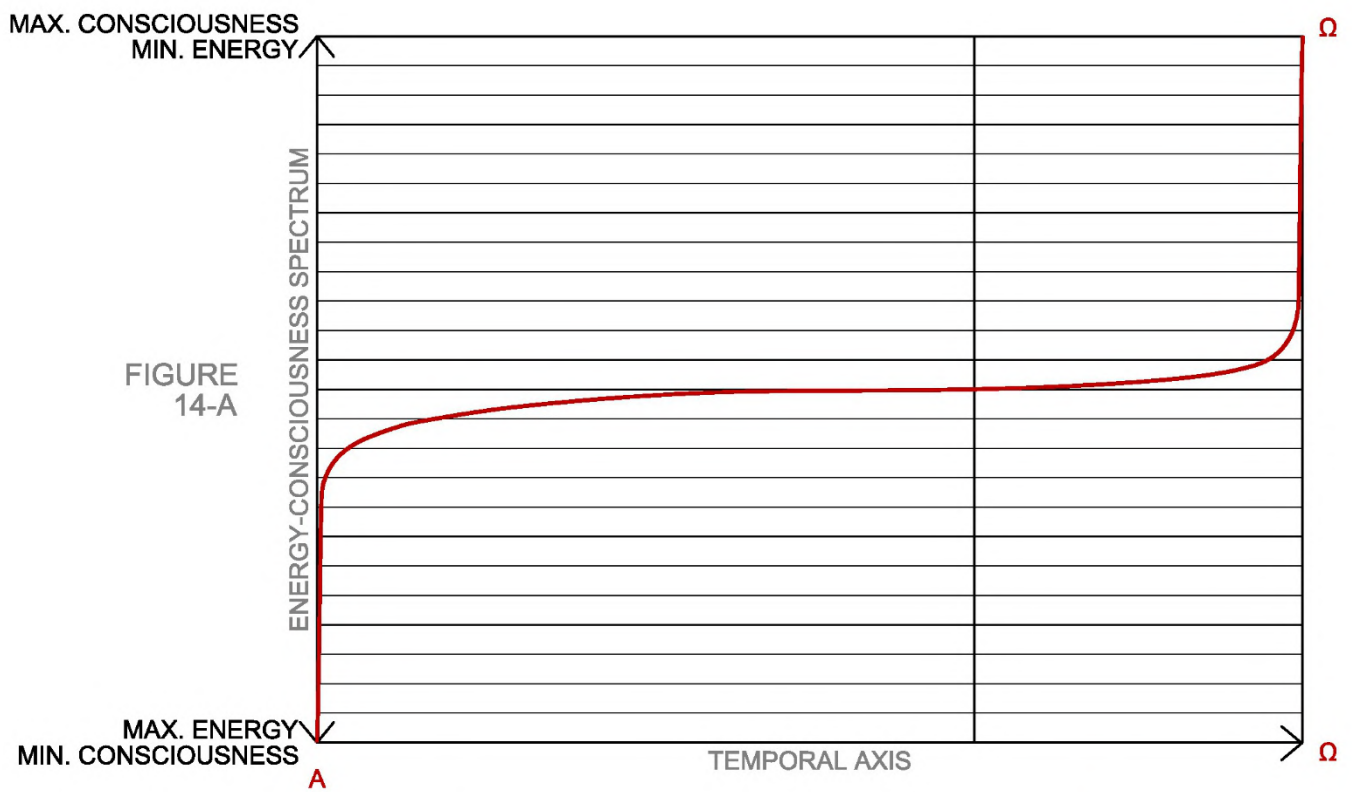


FIGURE 14

and the final pole ( $\Omega$ ) of all processes. The center of this toroidal dynamic, which manifests itself as the spatiotemporal universe as a whole and as each and every one of the structures that compose it, is hence the same and unique non-dual Self-evidence, without form, unlimited, timeless, ineffable, both empty and full, the source and goal of all worlds, absolute potentiality. Let us insist once more, this non-dual center is one and the same in everything and in all, its true nature, its ultimate identity.

Accordingly, for this faceless, pure Self-evidence to contemplate itself, it needs to dualize—at least apparently—in the roles of eye and mirror, subject and object, because this allows it to update its infinite potential in the world of finite forms. In this way, as we have seen, the non-dual center, without ceasing to be so, manifests itself in polar form as the original source of energy and the final attractor of consciousness, generating an illusory temporal distance between both facets. Let us take a good look at this idea, because within it may lie the solution to many of the enigmas that science is encountering. The absolute Void, in which there is no trace of separateness, manifests itself dually in the world of forms, so that the presumed spatiotemporal distances that the “subjects” observe among the “objects” are, ultimately, purely illusory.

Previously we proposed that the vibration of the illusory “string” of energy-consciousness that is created between the A and  $\Omega$  poles, generated, from the very same original moment, a particular fundamental sound and a whole range of harmonics, which constituted the entire spectrum of potential archetypal levels, which, as we have seen, are updated, step by step, throughout evolution and history. We must now apply this very same multilevel energy-consciousness scheme that we proposed in the “string” of our hypothesis to the vibrant “torus” that, as we have proposed, generates the entire universal process. We will thus have a toroidal dynamic deeply nested in a myriad of levels—like a “matryoshka” or nested dolls—, from the tiny scale of Planck to the cosmic totality, thus reflecting the radical fractal structure of the universe (see Fig. 14-D). The fundamental characteristic of this fascinating nested torus lies in the fact that the center is common and identical in all its levels. Thus, all the universal flows, whatever the height of the energy-consciousness spectrum through which these unfold, start out from and end in this ineffable non-dual center that unites in itself the facets of both source—A—and receptacle— $\Omega$ —of all the worlds.

This fractal, toroidal structure of reality greatly facilitates the understanding of the evolutionary process. Thus, starting out from the idea that, in the final analysis, the sole protagonist of all the processes is the same and unique Self-evidence, we will now describe how the dynamics of evolution unfolds, step by step.

We stated earlier that the non-manifest Void apparently polarizes as subject and object to perceive itself subjectively-objectively in infinite ways. Via this artifice, Self-evidence can delve into the furthest corners of its own infinity—illusively and fleetingly identifying its absolute Here-Now with any relative point-instant of pixelated space-time and, from there, contemplate itself from a certain perspective—at any level of the energy-consciousness spectrum of the nested torus—, returning instantaneously to its original fullness. Given that, as we have stated, the temporal dimension is purely imaginary, everything in fact occurs from instant to instant. This exit and return, moment-by-moment, between the non-dual foundation and its finite and fleeting manifestation in space-time allows us to update in the relative world of forms the

potential levels of stability of the energy-consciousness spectrum, i.e. the entire hierarchy of “harmonics” generated at the same original moment.

This recursive dynamic between the infinite Void and all its spatiotemporal forms is intrinsically creative and is facilitated by the unified field of memory that is gestating, step by step, at a fundamental level. All the information gathered at any point-instant of the manifested world is immediately introjected into this basic field of collective memory, whose potential is logically increased moment by moment. Thus, any entity, whatever the level of the spectrum in which it develops, has deep down in itself free access to the entirety of this unified field of memory, although it only connects with certain aspects of this field depending on its characteristics specific. The toroidal dynamic thus possesses a holographic structure, in the sense that each “part” of itself has information of the “totality”, and is, in fact, a particular reflection of that totality.

From the perspective that we are proposing here, the evolutionary process can be understood as a natural expression of a toroidal, integral, non-dual, fractal and holographic dynamic of fundamental energy-consciousness. Via this recursive dynamic, the ever present Self-evidence is focused, moment after moment, on the successive levels of the “harmonic” spectrum, beginning with the most basic ones —primarily energy— and ending at the highest levels —primarily consciousness—. On each plane, it updates the specific potential of that level, integrating it with the aspects that have already emerged in previous levels. In each turn, starting from the resources available in the unified field of memory, it is projected in each concrete situation of space-time, it perceives that determined situation according to the possibilities of its structure, and, immediately, introjects that information into the field of collective memory of the fundament. When a specific entity has unfolded the full potential of the stratum in which it basically develops and has integrated it with everything that has emerged in the preceding stages, once it has reached a specific level of complexity, it can resonate with the next “harmonic” of the energy-consciousness spectrum, and thus ascend to a new rung of the long ladder of evolution. And so on.

This toroidal, non-dual, fractal, holographic dynamic of the fundamental energy-consciousness that we are proposing has clear affinities with ancient intuitions of the wisdom traditions —the yin-yang of Taoism, the Celtic triskelion, the Egyptian seed of life, the Greek caduceus, the Hindu kundalini... even the symbol of  $\infty$  is no other than the cross section of a horn torus!—. However, as we have stated, it is practically unacceptable for the materialist paradigm of classical science. In the wake of the emergence of quantum physics and relativistic theory, the landscape has changed drastically, with numerous innovative proposals emerging throughout the past century that, in these first decades of the new millennium, have begun to crystallize into a ground-breaking unified theory of fields that, in many aspects, is in tune with the toroidal evolution we are proposing here. Below, we provide a brief recap of some of the work, carried out in very different fields, that has shone new light on the landscape of science.

First, it is important to recall the pioneering proposals on toroidal dynamics by **Walter Russell** —*The Universal One*—, **R. Buckminster Fuller** —*Synergetics*—, **Arthur M. Young** —*The Reflexive Universe*— and **Itzhak Bentov** —*A Brief Tour of Higher Consciousness: A Cosmic Book on the Mechanics of Creation*—. Concerning the creative trend of universal dynamics, it is necessary to mention **Jan C. Smuts**’ “holism”

—*Holism and Evolution*—, **Pierre Teilhard de Chardin**’s “Omega Point” —*Le Phénomène Humain*—, the notion of “syntropy” proposed by **Luigi Fantappiè** —*Principle of a unitary theory of the physical and biological world*— and **John A. Wheeler**’s “participatory anthropic principle”. As to the nested character of the world, reference should be made to the concept of “holon” put forward by **Arthur Koestler** —*The Ghost in the Machine*—, that of “fractal geometry” proposed by **Benoît Mandelbrot** —*Fractal geometry of nature*—, and **Ken Wilber**’s “holoarchival evolution” —*Sex, ecology, spirituality*—. With respect to the holographic principle, it is essential to recall **David J. Bohm** —*Wholeness and the Implicate Order*— and his theory of the “holomovement” between deep reality or “implicate order” and superficial reality or “explicate order”, the “holographic brain” proposed by **Karl H. Pribram** —*Languages of the Brain*—, **Rupert Sheldrake**’s “morphogenetic fields” —*A New Science of Life*—, the “Akashic field” of information proposed by **Ervin Laszlo** —*The Akasha Paradigm: Revolution in Science, Evolution in Consciousness*—, and the work of **Gerard 't Hooft** —*The Holographic Principle*—, improved by **Leonard Susskind**. Regarding the relationship between the micro and macro scales, it is worth recalling the work in quantum neuro-bio-physics by **Stuart R. Hameroff** and **Roger Penrose** —*Consciousness in the universe: A review of the 'Orch OR' theory*—, and that by **Dirk K.F. Meijer** and **Hans J.H. Geesink** —*Consciousness in the Universe is Scale Invariant and Implies an Event Horizon of the Human Brain*—. We will finish this rapid list of research on the cutting edge of science that are in tune with some key points of our proposal, making special mention of the ground-breaking work by **Nassim Hamein** and his collaborators **William D. Brown** and **Amira Val Baker** —*The Unified Spacememory Network : from Cosmogenesis to Consciousness* [ <https://holofractal.org/spacememory.pdf> ]—, as their “Holofractographic Theory of the Unified Field” brilliantly integrates the fractal, holographic and toroidal approaches that define our hypothesis.

(There are currently numerous pages on the internet that echo this emerging perspective of a toroidal, holographic and fractal universe. Readers who are interested in this topic are recommended to consult the following websites: “The Fractal-Holographic Universe” by **Andreas Bjerre** [ <http://holofractal.net/> ], “Cosmometry” by **Marshall Lefferts** [ <http://cosmometry.net/> ] and “Volution Theory” by **Peter Merry** [ [www.volutiontheory.net](http://www.volutiontheory.net) ]).

## Addendum 7: Entropic-Syntropic Evolution

Following one of his surprising mathematical discoveries, Carl F. Gauss stated: “*Now that I have the solution, I just need to find the logical process that leads to it.*” In the present investigation, we find ourselves in a situation similar to that of Gauss. Throughout these pages, we have shown that, far from being a mere product of chance and meaningless, evolution follows a very precise rhythm of unfolding and folding between an original pole, basically of energy, and a final pole, basically of consciousness. How is this possible? What mechanism causes things to happen this way? So far, we have mainly limited ourselves to recounting some facts and to revealing the surprising pattern that links them. In this addendum, we will try to provide the key to explaining this mysterious behaviour of the evolutionary universe. As we will soon see, the transactional interpretation of quantum mechanics will provide us with the final clue.

Let us first delve a little into history to grasp the profound implications of the matter at hand. In the 1850s, the physicist and mathematician Rudolf Clausius established the concept of a thermodynamic system and postulated the thesis that in any energy transformation process, a small amount of energy is gradually dissipated across the system boundary. Energy thus gradually and irreversibly passes from a state of high potential and availability to a state of low potential and unavailability. Clausius coined the term “entropy” to refer to the physical magnitude that measures that amount of energy that is not reusable to do work and which is inexorably lost in the environment. The universe as a whole—which is an isolated system—tends to progressively distribute energy uniformly, increase its degree of homogeneity and disorder, and maximize entropy, and is therefore condemned to thermal death when it finally reaches the state of thermodynamic equilibrium. In this respect, the physicist Arthur Eddington affirmed that “*entropy is the arrow of time*”, as it forces physical events to move in a certain temporal direction, the one that is familiar to us, i.e. from the past to the future.

At the same time as Clausius was developing the science of thermodynamics, Charles Darwin was expounding the theory of evolution. Controversy was served! While according to the second law of thermodynamics the processes of energy transformation inevitably tend towards dissipation, uniformity, disorder and homogeneity, it turns out that, at the same time, the processes of biological evolution move in exactly the opposite direction, i.e. towards order, differentiation, complexity and organization. Could it be that evolution does not follow the principles of thermodynamics? The response from the currently dominant scientific paradigm is limited to clarifying that the second law is only applicable to closed and isolated systems, that complex systems are open—that is, they exchange matter and energy with their environments—and that, although they decrease the entropy in their interior—generating order among their components—they do so at the cost of increasing it around them. Note that this answer only indicates that *there is no contradiction* between the second law of thermodynamics and the appearance of complex systems, but it *does not explain* this appearance at all, nor does it explain their subsequent maintenance without degradation, and even less so, their progressive development towards higher levels of complexity and organization. Not to mention, of course, the harmonic rhythm in which this surprising display of creativity takes place, as we have seen in our research.

Given that classical thermodynamics has not been able to explain the creative dynamics of life, there have been numerous authors over the course of more than a century who have attempted to provide an answer, from very different perspectives, to the dilemma thus posed. Let us recall, for instance, the “*élan vital*” of the French philosopher Henri Bergson (1859-1941), the “*entelechy*” of the German biologist Hans Driesch (1867-1941), the “*synchronicity*” of the Swiss psychiatrist Carl Jung (1875-1961), the “*Omega point*” of the French palaeontologist Pierre Teilhard de Chardin (1881-1955), the “*negative entropy*” of the Austrian physicist Erwin Schrödinger (1887-1961), the “*negentropy*” of the French physicist Léon Brillouin (1889-1969), the “*general plan*” of the Hungarian physicist-chemist Michael Polanyi (1891-1976), the “*principle of syntropy*” of the Hungarian physiologist Albert Szent-Györgyi (1893-1986), the “*syntropy*” of the American architect Richard Buckminster Fuller (1895 -1983), the “*higher laws*” of the Hungarian physicist Eugene Wigner (1902-1955), the “*biotonic laws*” of the German physicist Walter Elsässer (1904-1991), the “*chreode*” of the British biologist Conrad Waddington (1905-1975), the “*stratified stability*” of the Polish mathematician Jacob Bronowski (1908-1974), the “*retrocausality*” of the physicist

French Olivier Costa de Beauregard (1911-2007), the “holomovement” of the American physicist David Bohm (1917-1992), the “dissipative structures” of the Russian chemist Ilya Prigogine (1917-2003), the “attractor” of the American mathematician Edward Lorenz (1917-2008), the “theory of catastrophes” of the French mathematician René Thom (1923-2002), the “fractal geometry” of the Polish mathematician Benoît Mandelbrot (1924-2010), the “Akashic field” of the Hungarian systems theorist Ervin Laszlo (1932), the “anthropic principle” of the Australian physicist Brandon Carter (1942), the “morphogenetic fields” of the British biochemist Rupert Sheldrake (1942), the “Feigenbaum numbers” of the American mathematician Mitchell Feigenbaum (1944-2019), the “self-organized criticality” of the Danish physicist Per Bak (1948-2002), the “Eros” of the American integral philosopher Ken Wilber (1949) and so on. Yes; it would seem that there really is something more than entropy in this evolutionary universe.

Our research is clearly in tune with many of the proposals mentioned above, some of which are even very close to solving the issue raised at the beginning of this addendum. Let us recap the question: What mechanism in nature is capable of causing evolution, in counterbalance to the second principle of thermodynamics, to follow a very precise divergent-convergent spiral pattern between an original pole of energy and a final pole of consciousness? As we have stated, the transactional interpretation of quantum mechanics may provide us with the long-awaited answer. Let us now look at some approaches that point in this direction.

In 1940, the Italian mathematician Luigi Fantappiè (1901-1956) sought to find a unified theory of the physical and biological world that would explain the emergence of complex and organized forms in a universe dominated by entropy. He thought that the solution to this enigma had to be found in the fundamental principles of physics, in the very structure of the equations that combine quantum mechanics and special relativity. A key equation in this field is the d’Alembert operator, which, in the relativistic Klein-Gordon generalization of the Schrödinger wave equation, admits two types of solutions: **divergent waves**, described by the so-called “retarded potentials”, that branch from the original emitting source, and **convergent waves**, described by the “advanced potentials”, that converge at a future point that acts as an absorber or attractor. On analyzing the mathematical properties of these two solutions, Fantappiè found that, while the positive solution moves forward in time and tends towards dissipation, disorder and homogeneity, the negative solution moves backward in time and tends towards concentration, order and complexity. He thus understood that the first solution actually follows the law of **entropy** —from the Greek *en* = divergent, and *tropos* = tendency— while the second obeys a symmetric law that he called **syntropy** —from the Greek *syn* = convergent, and *tropos* = tendency—. Observing that the properties of the law of syntropy were exactly those characteristics of living beings, Fantappiè concluded that the increase in complexity in the evolutionary process is a consequence of the advanced —retrocausal— waves that emanate from attractors located in the future and go backwards in time. That is why, he stated, “*advanced waves are the essence of life itself*”. Life is caused by the future.

We insist that, far from being a mere product of speculation, these retrocausal waves appear in a rigorous mathematical way when the fundamental equations of special relativity and quantum mechanics are studied jointly. What is truly surprising is that the researchers who made their theoretical discoveries later refused to accept their real

existence, not for scientific reasons, but simply because of the preconception that the final causes were impossible. However, Luigi Fantappiè refused to eliminate half of the solutions of the fundamental equations of the universe and consistently argued that life is subject to a double causality: efficient causality and final causality. He thus proposed replacing the mechanistic and deterministic model of the universe with a new, entropic-syntropic model, in which the expansive forces (entropy) and the cohesive forces (syntropy) worked together, so that the unfolding of phenomena was not only a function of the initial conditions, but also depended on a final attractor.

One of Fantappiè's main students, the physicist Giuseppe Arcidiacono (1927-1998), together with his twin brother Salvatore (1927-1998), a chemist by profession, re-examined the unitary theory of the physical and biological world of their mentor in order to clarify the separation established between entropic and syntropic phenomena. They proposed a new version of the theory in which they argued that there are actually no "pure" entropic or syntropic events, but that there exist both entropic and syntropic components acting together, in all phenomena, whether physical or biological. The result is an entropic-syntropic model of the universe with a "cybernetic structure" that makes it possible to establish a link between Fantappiè's unitary theory and the most recent research on systems theory, chaos and complexity.

Without knowledge of Fantappiè's work, the Italian experimental psychologist Ulisse Di Corpo (1959) independently formulated the theory of syntropy in 1977 from a slightly different starting point. Instead of starting from the d'Alembert operator of the wave equation of quantum mechanics, as Fantappiè had done, he began by working with the original and complete energy-momentum-mass equation of Einstein's special relativity:  $E^2 = p^2 c^2 + m^2 c^4$ , where  $E$  is energy,  $p$  is momentum,  $m$  is mass, and  $c$  is the constant for the speed of light. As this is a second-degree equation, it always has two solutions: one positive and one negative. The positive solution describes energy that diverges forward in time from a past source, while the negative solution describes energy that diverges backward in time from a future source. At the time, this second solution was considered unacceptable because it implied retrocausality, i.e. the effect took place before its cause. Einstein managed to solve this problem by considering that momentum,  $p$ , is practically equal to zero, because the speed of physical bodies is extremely small compared to the speed of light. In this way, the complex Einstein equation of energy-momentum-mass was simplified into the now famous equation  $E=mc^2$ , which has only one positive solution.

However, in 1924, the Austrian theoretical physicist Wolfgang Pauli discovered the spin of electrons. Spin is an angular momentum, a rotation of the electron on itself at a speed close to the speed of light. Thus, in this case, momentum,  $p$ , cannot be considered equal to zero and therefore the energy-momentum-mass formula must be used in its full version. For this reason, in 1928, when combining Einstein's special relativity with quantum mechanics, the British theoretical physicist Paul Dirac applied the complete energy-momentum-mass equation to the study of electrons and once again encountered the unwanted dual solution —positive and negative— in the form of electrons and their antiparticles. The Dirac equation thus leads to a universe made of matter moving forward in time and antimatter moving backward in time. The antiparticle of the electron, predicted theoretically by Dirac, was observed experimentally in 1932 by the American physicist Carl Anderson —by photographing the traces of cosmic rays in a cloud chamber— and was given the name *positron*. Anderson thereby became the first



person to empirically prove the existence of the negative energy solution and waves that propagate backward in time, from the future to the past. The negative solution was thus no longer an impossible mathematical absurdity, but became empirical evidence. We now know that each subatomic particle has a corresponding antiparticle that flows in the opposite direction of time, from the future to the past: antielectrons, antiprotons, antineutrons and so on.

The meeting between Ulisse Di Corpo and the cognitive psychologist Antonella Vannini, in 2001, relaunched research on the entropic-syntropic theory. [Some of the information contained in this addendum is taken from the *Syntropy Journal* digital publication —<http://www.sintropia.it/journal/index.htm>— edited by Ulisse and Antonella since 2005]. At the time, Fantappiè was not able to devise a way to reveal the existence of future causes in the laboratory. In recent decades, however, a growing number of studies —by Dean Radin, Dick Bierman, James Spottiswoode, Patrizio Tressoldi, among others— have demonstrated the existence of prior reactions to stimuli in the parameters of skin conductance or cardiac frequency. For her part, in her doctoral work, Vannini managed to carry out four experiments using heart rate measurements to study Fantappiè's proposal regarding retrocausality and António Damasio's learning effect. The hypothesis on which she worked was very simple: if life is supported by syntropy, the parameters of the vital systems that support life, such as the autonomic nervous system, should show retrocausal activations. Her thesis provided ingenious methodologies and positive experimental results that succeeded in turning syntropy studies from a mere hypothesis into a sound scientific theory supported by rigorous mathematics and abundant experimental evidence.

Around 1940, the American theoretical physicists John A. Wheeler (1911-2008) and Richard Feynman (1918-1988) proposed what is known as “absorber theory”, which is an interpretation of electrodynamics that derives from the assumption that the solutions of the electromagnetic field equations must be invariant under time inversion symmetry. It is hence a symmetric theory in time. In general, Maxwell's equations and the equations of electromagnetic waves have two possible solutions: a retarded solution —moving forward in time— and an advanced solution —moving backward in time—. In principle, there is no apparent reason for the breaking of time reversal symmetry, pointing to a preferential direction of time. Nonetheless, advanced solutions are normally ruled out in the interpretation of electromagnetic waves. In absorber theory, however, charged particles are considered both as emitters and absorbers, and the emission process is related to the absorption process in the following way: both the retarded waves that travel from the emitter to the absorber and the advanced waves that travel from the absorber to the emitter are taken into consideration; the sum of the two, however, results in causal waves, although retrocausal solutions are not ruled out a priori.

From the start, the traditional interpretation of quantum mechanics —the Copenhagen interpretation— has shown a fierce reluctance to accept negative solutions as actually existing, i.e. those that move backwards in time, which naturally follow on from the fundamental equations. Diverse research over the last century has shown, over and over again, the major difficulties of this standard interpretation in assuming certain empirically contrasted phenomena, such as non-locality, entanglement and retrocausality. This led the American physicist John G. Cramer (1934) to propose an alternative interpretation in 1986, which he called the Transactional Interpretation of



Quantum Mechanics (TIQM). Inspired by Wheeler and Feynman's "absorber theory", the transactional interpretation describes quantum interactions in terms of a **standing wave formed by interference between retarded (forward in time) and advanced (backward in time) waves**. It is a "pure" interpretation of quantum mechanics, in the sense that it does not add anything ad hoc, but simply provides a physical referent for a part of the mathematical formalism used in standard textbooks —advanced waves— that the traditional interpretation has repeatedly eliminated. Its predictions are therefore the same as those of the Copenhagen interpretation, but nevertheless it avoids many of its problems and solves, in a simple and elegant way, all the great quantum mysteries, such as the EPR paradox, Schrödinger's cat, Wigner's friend, Wheeler's retarded solution, etc. This model thus provides a clear visual picture that explains, without any artifice, the puzzling experimental results that appear daily in quantum physics laboratories around the world. According to the astrophysicist and science writer John Gribbin, Cramer's interpretation of quantum mechanics "*provides the best complete picture of how the world works at the quantum level*", and, "*hopefully, it will replace the Copenhagen interpretation as the standard way of thinking about quantum physics for the next generation of scientists*".

This transactional model may be summarized as follows. The emitter produces a retarded wave of "offer", forward in time, which travels towards the absorber, causing the absorber to produce an advanced wave of "confirmation", backward in time, which travels back to the emitter. The interaction is repeated cyclically until the net exchange of energy, momentum, angular momentum and other conserved quantities satisfies the quantum boundary conditions of the system, at which point the transaction is definitively completed and the real quantum event, the "collapse of the wave function", occurs. Of course, the "pseudo-temporal" sequence in this account is only a semantic convenience to describe a process that is actually timeless, given that, according to the laws of relativity, time does not pass at all from the point of view of waves, because, as they travel at the speed of light, their moment of departure and their moment of arrival are one and the same moment. An observer unaware of these internal mechanisms of nature would perceive only the completed transaction, which could be reinterpreted as the passage of a single retarded photon —i.e. positive energy— traveling at the speed of light from an emitter to an absorber. In a more simplified version, we could say that the emitter produces an "offer" wave that travels to the absorber, that the absorber then returns a "confirmation" wave to the emitter, and that the transaction is finally completed with a "handshake" —a standing wave— through space-time, via which a bidirectional contract is sealed between past and future. As Cramer states "*This universe (...) advances in time at the quantum level through a chain of handshakes between the past and the future (...) The future goes back to make an accommodation with the past that allows a quantum event to happen, to become reality. Each quantum event emerges into reality as a result of a feedback loop between the past and the future. These are allowed time-shaped loops that give rise to the universe*".

Extending the work of John Cramer, the American physicist and philosopher of science Ruth E. Kastner (1955) has developed a new Transactional Interpretation, called Relativist Transactional Interpretation (RTI) or Possibilist Transactional Interpretation (PTI), which holds that quantum wave functions do not move in the physical universe, but exist as "possibilities" in Hilbert's multidimensional space, from which transactions emerge in the "real" universe. Kastner proposes considering the outgoing offer waves and the many incoming confirmation waves as "possible" transactions, existing outside

of space-time, of which only one becomes empirically “real”. She suggests defining them with the term “potentia” —with which Aristotle called the ability to be something in the future—, in tune with the statement by the German theoretical physicist Werner Heisenberg: “Elementary atoms or particles are not real in themselves; they form a world of potentialities or possibilities, and not so much a world of things or of facts or data”. In this sense, Kastner states that offer and confirmation waves are sub-empirical and pre-space-time “possibilities”, i.e. they have not yet appeared in space-time, and therefore calls them “incipient transactions”.

Kastner calls for a new metaphysical category to describe those “not quite real possibilities” which, far from being mere abstractions, constitute a higher-dimensional world whose structure is described by the mathematics of quantum theory. She raises the need to consider such “possibilities” as part of a reality that encompasses much more than what is contained in space-time. In fact, space-time events, the events of the concrete world that we experience around us with our five senses, are products that emerge from the transaction processes —timeless and non-local— that take place in the quantum realm. The “iceberg” metaphor used by Freud to describe the human subconscious can equally be applied to Kastner’s “ontological realm of possibility” or “quantumland”. “Quantumland” refers to the mass of the iceberg that exists beyond our sight, while the tip, the space-time appearance, is only a small part of everything that is the physical universe. Although they take place outside of space-time, quantum processes constitute a fundamental part of that universe.

At the beginning of this addendum, we wondered how it was possible for evolution to follow such a precise unfolding and folding rhythm between the original and final poles, as has been shown throughout this research. And we asked the question: Is there some natural mechanism capable of causing things to happen in such an unexpected way? We thus suggest that we may find the long-awaited answer in the so-called Transactional Interpretation of Quantum Mechanics. For this reason, in the previous paragraphs we have summarized the basic points of Luigi Fantappiè’s entropic-syntropic theory, on the one hand, and of John Cramer’s transactional interpretation, on the other. Next, we shall recall some fundamental ideas of our “non-dual evolution” to then consider how Fantappiè and Cramer’s proposals provide us with the definitive key to explaining the mysterious evolutionary pattern.

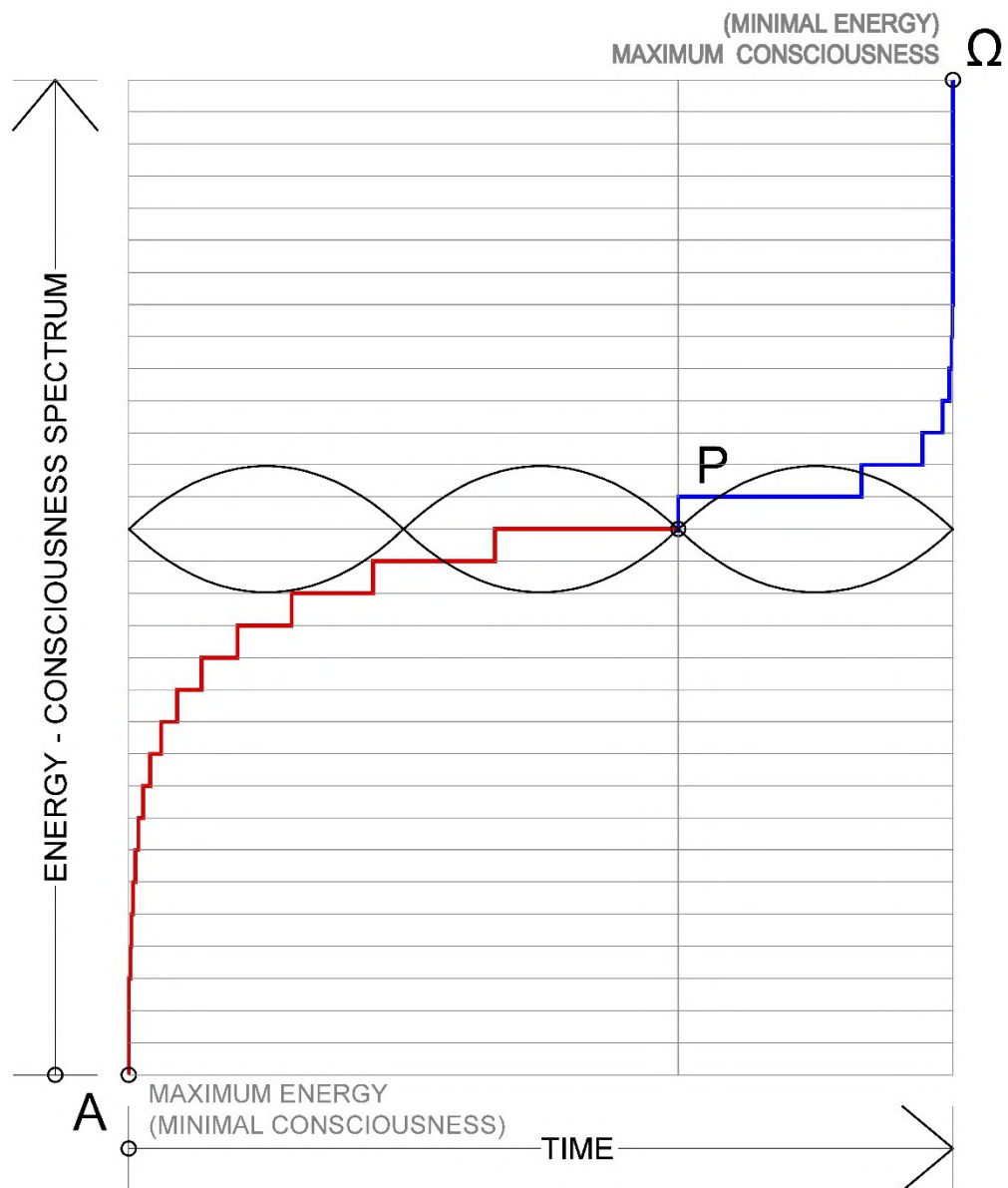
As we have previously seen, all manifested reality inexorably appears in the form of dualities —there is no object without a subject, no energy without consciousness, or outside without inside— and, as all opposites are mutually dependent, we can understand them as polar manifestations of a reality that transcends them and that is “prior” to said dualization. We hence proposed that the original quantum void posed by physicists and the final mystical void experienced by contemplatives are no other than one and the same Void, perceived by physicists objectively and by contemplatives subjectively, but which, in itself, is neither objective nor subjective, but “prior” to this dual perspective. Finally, we clarified that this Emptiness does not refer to a distant metaphysical reality, but to the simple and pure Self-evidence of each present instant, which encompasses in itself all the manifestations of energy and consciousness that are observed in the space-time universe. According to this perspective, ultimate reality is hence not solely energy, as the materialists claim, nor solely consciousness, as the spiritualists claim, but the ineffable non-duality of these two apparent facets. The

universe, dear reader, is made up of the simple and evident Presence that you are in this precise timeless moment that is Now and always Now.

We have also stated that, as there is no separation between subject and object in this absolute Self-evidence, and therefore it is not “something” that can be seen by “someone”, in order to manifest itself relatively before itself it needs to be polarized in appearance as subject and object, in the same way that 0 can dualize into +1 and -1 without changing its intrinsic value. For this reason, we proposed that, in its attempt to see itself, Self-evidence apparently dualizes as an original pole (basically of energy) and a final pole (basically of consciousness), thus generating, in the same primordial moment, an illusory distance between the two, which, on vibrating —like the guitar string in our hypothesis— gives rise to a whole range of harmonics, which are precisely the “potential levels of stratified stability” (Bronowski) that will be successively updated through the cycles of the evolution that we have studied, covering the entire spectrum of reality from the most basic strata —of enormous energy and little consciousness— to the highest —of little energy and enormous consciousness—.

It is also important to understand that everything happens in the absolute Now and that time is simply an imaginary construction with which our minds order the emergence of successive relative instants. For this reason, when we use the terms “past” or “future”, we are not talking about distant situations, but are only referring to partial aspects of the immutable timeless Now that contains in itself the totality of “time”. We stated a moment ago that the unmanifested Emptiness is apparently polarized as subject and object so as to perceive itself subject-objectively in infinite ways. Via this ploy, Self-evidence can delve into the furthestmost corners of its own infinity —fleetingly identifying its absolute Here-Now with any relative point-instant of pixelated space-time—, in order to contemplate itself from a certain perspective from there —at any level of the spectrum of energy-consciousness—, immediately returning to its original fullness. The time dimension is thus purely imaginary. Everything actually happens from moment to moment. This departure and return instant after instant between the non-dual foundation and its finite and fleeting manifestation in space-time allows the *potential* levels of stability of the energy-consciousness spectrum to be *actualized* in the relative world of forms, i.e. the entire hierarchy of standing waves —musical harmonics— generated at the same original instant. For an integral understanding of the universe, we will thus have to refer to three different, although dynamically interrelated, facets: **non-dual absolute reality** —the simple and timeless Self-evidence without form—, **potential relative reality** —the potential spectrum of energy-consciousness generated in the original polarization— and **space-time relative reality** —the actualization moment after moment of the successive potential levels of stratified stability—.

In Figure 15 we have once again represented the complete pattern of the unfolding-folding process between the original pole of energy —A— and the final pole of consciousness —Ω—, as it manifests itself in global evolution and in the individual development of the human being. Let us recall that this trajectory can locate its “fundamental sound” at any level of the energy-consciousness spectrum, as we stated previously in figure 7. Precisely, in this graph we see that the inflection point —P— of the trajectory takes place on the border between the “material” and the “vital” levels in the case of human *phylogeny*, and between the “mental” and the “soul” levels in the



LUIGI FANTAPPIÈ	ENTROPY - SYNTROPY THEORY	<p>ORIGIN</p> <p>CAUSALITY DIVERGENCE ENTROPY</p> <p>EFFECT</p> <p>RETROCAUSALITY CONVERGENCE SYNTROPY</p> <p>FINAL ATTRACTOR</p>
JOHN G. CRAMER	TRANSACTIONAL INTERPRETATION	<p>EMITTER (PAST)</p> <p>RETARDED WAVE "OFFER"</p> <p>TRANSACTION</p> <p>ADVANCED WAVE "CONFIRMATION"</p> <p>"HANDSHAKE"</p> <p>ABSORBER (FUTURE)</p>

FIGURE 15

case of our *ontogeny*. As we have stated in the previous paragraph, given that each point-instant of the relative world is born and returns, moment after moment, from and towards its timeless foundation, we can also affirm that this complete unfolding-folding trajectory similarly reflects the whole life of each moment —what Ken Wilber calls *microgeny*—, which can be focused on any level of the energy-consciousness spectrum, from the most physical to the most spiritual planes.

At the bottom of Fig. 15, we highlight the resonance between our evolutionary scheme —the unfolding-folding fractal pattern between pole A and pole  $\Omega$ — and the proposals of Fantappiè —regarding the entropic-syntropic (divergent-convergent) dynamics between the original source and the final attractor— and Cramer —regarding the “handshakes” of retarded “offer” waves and advanced “confirmation” waves between emitters and absorbers. Herein lies the answer to the question we posed at the beginning of this addendum as to what natural mechanism can cause the evolutionary pattern to unfold in such an unexpected way. The entropic-syntropic theory and the transactional interpretation make it clear to us that **all the events of the space-time universe arise, moment after moment, via the simultaneous and coordinated action of flows from the actualized “past” and the potential “future”, and, ultimately, from the original emitter and final absorber.** In this sense, we could complement Einstein’s phrase about “*God does not play dice with the universe*”, stating that he does, but that he only counts the winning moves. That is, of all the potential offer waves from the past, only those that are in resonance with the confirmation waves from the future are updated in space-time. This, in turn, brings to mind Teilhard de Chardin’s idea about “*the preferential utilization of chance*”.

This approach greatly clarifies the so-called “anthropic principle”, which suggests that we live in a carefully adjusted universe, i.e. in a universe that seems to have been meticulously arranged to allow the existence of life and mind, because, if any of the basic physical constants had been different, the appearance of life as we know it would not have been possible. If, as we see here, all the events of the universe arise from the interaction and consensus between the past and the future, it is completely natural that, without having to resort to any external designer, the first events of the universal process were already fully coordinated and adjusted to future events. How could it be otherwise! In the same way, with respect to our divergent-convergent pattern, we must state that all the successive levels of the evolutionary ladder —which, as we saw in our research, unfold at the rate set by the second harmonic— are defined, like all quantum interactions, by **standing waves formed by interference between retarded (forward in time) and advanced (backward in time) waves**, which is precisely the core of Cramer and Kastner’s transactional interpretation!

From the perspective of the mechanistic paradigm, our proposal regarding a fractal pattern of unfolding-folding between the original and final poles in the evolutionary process is complete nonsense. However, as we have just seen, from the syntropic and transactional perspective, this pattern is precisely the most natural, coherent expression with respect to the intrinsic simultaneously causal and retrocausal mechanism of the universe. Materialism has tried to understand the world by dispensing with half of it and has failed in its attempt to explain life, mind or consciousness. It has sufficed to take reality in its entirety in order to shine light on all areas of the panorama. Isn’t it time to change the paradigm?

## Addendum 8: The evolutionary dance of Emptiness

*"Time is a moving image of eternity that progresses in a circle" (Plato)*

*"The now that passes produces time, the now that remains produces eternity" (Boethius)*

In this addendum we are going to recapitulate and develop some of the fundamental points that have been appearing throughout these pages. We trust that, by presenting them in a unified way, we will be able, in the end, to outline a truly comprehensive panorama of the creative dynamics of reality, capable of clarifying, with simplicity and without artifice, many of the great questions that humanity has asked itself since always and to which materialistic science has not been able to respond.

In a previous addendum we have stated that, in order to achieve a truly integral understanding of everything exposed throughout our research, it is absolutely necessary to refer to at least three different facets of the All-One: A) **non-dual absolute reality**, B) **potential relative reality** and C) **spatiotemporal relative reality**. Next, we will try to specify the meaning of each of these expressions.



### A) Non-dual absolute reality

All manifested reality appears, inexorably, in the form of dualities. It is not possible to find subject without object, inside without outside, origin without end... Nor vice versa. Therefore, since all opposites are mutually dependent, we can understand them as polar manifestations of a reality that transcends them and that is "prior" to that dualization.

Physicists speak of infinite potential energy in the original quantum void, and sages speak of infinite transparent consciousness in the final mystical void. Our proposal—in tune with the great non-dual wisdom traditions—is that these two voids are the same and unique Emptiness, perceived objectively by physicists and subjectively by contemplatives, but which, in itself, is not neither objective nor subjective, but "prior" to that dual perspective. Since in that Emptiness there is no separation between subject and object, it is not possible to see it in any way, because it is not "something" that can be seen by "someone", but, obviously, it is not "nothing" either, because, in fact, all the entities of the universe—objective or subjective—are nothing other than partial and relative forms of that non-dual Void. Although, strictly speaking, it is therefore not possible to make any statement about essential Emptiness, as an approximation we will

suggest that it is, in an undifferentiated way, potential energy and pure consciousness, that is, non-dual lucid-light or luminous-lucidity.

Positivist science will never be able to access this intrinsically ineffable Void, since the mere attempt to describe it objectively places the researcher "outside" of its non-dual scope. However, paradoxically, the Void we are talking about, far from being a distant, mysterious or unknown reality, is the closest, most intimate and obvious experience of our existence. Is there something more unquestionable than the **Certainty-of-Being** itself?... Is it that, dear reader, do you doubt for a single moment of your own reality?... Well, it turns out that this simple and pure ever present **Self-Evidence** that you are in your essence —prior to the slightest identification with any concrete form— is, precisely, the non-dual Emptiness that constitutes and comprehends all worlds. That simple Self-Evidence is the only substance of the universe as a whole and of each and every one of the entities that compose it!

The universe is not made only of energy —as the materialist monists claim—, nor just of consciousness —as the idealist monists claim—, but of the “prior” non-dual Emptiness that includes and transcends both facets. This statement clearly coincides with Baruch Spinoza's idea that the entire universe is made of a single substance — which he called “God” or “Nature”— which appears under two attributes: extension (matter) and thought (mind). Or, in the same way, with Friedrich Schelling's approach that the supreme principle must be an absolute that is at the same time object and subject, nature and spirit, that is, the unity, identity or indifference of both aspects. Perspectives similar to these are currently beginning to be suggested with increasing insistence, in many different fields of research, under the names of "dual-aspect monism" and "neutral monism." Thus, in the words of the German physicist Harald Atmanspacher: "dual aspect approaches consider the mental and physical domains of reality as aspects, or manifestations, of an underlying undivided reality in which the mental and the physical do not exist as separate domains. In such framework, the distinction between mind and matter results from an epistemic split that separates aspects of underlying reality.”

We propose, therefore, that the non-dual Emptiness, devoid in itself of any particular qualification or determination, is, at the same time, the ultimate essence of all existence, the pure, undifferentiated and formless matrix that sustains all worlds. There is no specific characteristic, concrete appearance or distinctive feature in it, but it is not a mere absence or absolute negation, but rather a state of unlimited, omnipresent and indestructible openness that "makes" the entire universe of finitude. A diaphanous, lucid and luminous realm that generates, sustains and embraces the entire universe of particularities. An infinite and limitless spaciousness, eternally self-evident, from which all the phenomena that take place in space-time arise, are in and return to.

The ultimate Void is a non-state in which nothing concrete can be perceived, but which is pregnant with everything that exists. Its absolute simplicity is infinite potentiality of all things. Where there is nothing, there is a place for everything. It is not, therefore, an impotent nothingness, but rather, on the contrary, it can make everything out of itself, remaining in its intimate bosom as eternal Emptiness. All things come from it, are in it, and return to it, but behind these fleeting forms, it remains immutable in its timeless

stillness, now, in the beginning, and forever. Beyond the change. Beyond birth and death. Ever present in his infinite game of dual appearances. Eternally empty and clear. Timelessly self-evident.



## **B) Potential relative reality**

Since non-dual Self-Evidence is completely devoid of the slightest separation between subject and object, it cannot formally perceive itself in any way. Therefore, if it wants to contemplate itself, it has no choice but to dualize... at least in appearance. The artifice is simple. Just as 0 can unfold as + 1 and - 1 without changing its value at all, fundamental Emptiness can unfold as object—an original pole, basically of energy—and subject—a final pole, basically of consciousness—, fully maintaining its empty essence. Between both poles, in this way, a wide spectrum of balances is generated between both polar facets, which covers the entire range from the most basic states —of enormous energy and little consciousness— to the highest —of little energy and enormous consciousness. When this illusory distance of energy-consciousness generated between both poles enters into vibration —like a guitar string— a characteristic fundamental sound and all its unlimited range of harmonic sounds (standing waves) are instantly produced. This means that, let's take a good look, from the very originary moment the entire spectrum of energy-consciousness is already fully present in an intertwined and resonant way.

As we have seen throughout our research, the successive second harmonics that arise with the vibration of the original "string" of energy-consciousness —the successive notes of the Pythagorean circle (spiral) of fifths— are precisely the potential levels of stratified stability that will be actualized, one after the other, along the successive evolutionary rungs that we have analyzed, and that will unfold rhythmically the complete spectrum of manifestation, from the most basic levels —of enormous energy and little consciousness— to the most high —of little energy and enormous consciousness. (It is suggestive to point out the parallelism between the hypothesis that we are exposing and the "string theory" currently proposed in theoretical physics, although in our case the field of application is not simply reduced to the world of microphysics, but rather covers the entire spectrum of reality. It is difficult to try to elaborate a "theory of everything" if practically the entire manifested evolutionary reality is marginalized!).



We would like to highlight here the hypothesis raised by the pharmacologist Dirk Meijer and the researcher Hans Geesink about a mathematical algorithm for coherent quantum frequencies that generate stability in both animated and non-animated systems. In their own words: "Interestingly, we found that the origin of the particular biological algorithm can be mathematically approached by a selected "tempered Pythagorean" reference acoustic scale. The algorithm expresses one-dimensional wave equations known for vibrating strings. The origin of the biological algorithm was condensed in a mathematical expression, in which all frequencies have ratios of 1:2 and closely approach ratios of 2:3." This 2:3 ratio is precisely the "second harmonic" that, as we have seen in our research, generates the evolutionary stability levels!

Returning to our discourse, when fundamental Emptiness unfolds as an objective pole (basically of energy) and a subjective pole (basically of consciousness), a bidirectional tension is automatically produced between both extremes: an expansive and entropic current coming from the initial pole of "**energy**-(consciousness)" and a contractive and syntropic current coming from the final pole of "**consciousness**-(energy)". Both flows travel, in opposite directions, the entire spectrum of potential levels of stability — standing waves— in which both polar facets are balanced in different proportions. Moment after moment, these ascending and descending flows resonate with each other at a certain level —standing wave— of the energy-consciousness spectrum, "collapsing", thus, in a concrete event.

(Readers interested in this point can consult the suggestive works on the "participatory anthropic principle" by John Wheeler, on "creative evolution" by Amit Goswami, or on "biocentrism" by Robert Lanza, and thus verify the similarities and the differences between these interpretations of quantum mechanics and what we are exposing here).

The proposal that we are developing is clearly in tune, obviously, with the syntropic theory of the mathematician Luigi Fantappiè. This theory affirms that the increase in complexity in the evolutionary process is a consequence of advanced waves that emanate from attractors located in the future and that go backwards in time. Thus, he proposes going from a mechanistic and deterministic model of the universe to a new model, entropic-syntropic, in which the expansive forces (entropy) and the cohesive forces (syntropy) work together, so that the unfolding of the phenomena is no longer only a function of the initial conditions, but also depends on a final attractor. This theory was later updated by the physicist Giuseppe Arcidiacono and by his twin brother Salvatore, a chemist by profession, developing an entropic-syntropic model of the universe with a "cybernetic structure", which makes it possible to establish a link between Fantappiè's unitary theory and the latest research on systems theory, chaos, and complexity. Currently, psychologists Ulisse Di Corpo and Antonella Vannini have relaunched research on entropic-syntropic theory, carrying out laboratory experiments with convincing results and thus managing to convert the syntropy hypothesis into a solid scientific theory supported by rigorous mathematics and abundant experimental evidence.

In clear resonance with all this, our approach is likewise very similar to the Transactional Interpretation of Quantum Mechanics —proposed by John Cramer and inspired by the "absorber theory" by John Wheeler and Richard Feynman—, which

describes the quantum interactions in terms of a standing wave formed by the interference between retarded (forward in time) and advanced (backward in time) waves. We can summarize this transactional model as follows: The emitter produces a retarded "offer" wave, forward in time, which travels towards the absorber, which causes the absorber to produce an advanced "confirmation" wave, backwards in time, which travels back to the emitter. The interaction is repeated cyclically until, finally, the transaction is completed with a "handshake" —a standing wave— through space-time, sealing a two-way contract between the past and the future, and produces the actual quantum event, the “collapse of the wave function”. The “pseudo-temporal” sequence of this story is, of course, just a semantic convenience to describe a process that is, in truth, timeless. We will return to this matter later.

Physicist and philosopher Ruth Kastner, extending the work of John Cramer, has developed a new Transactional Interpretation, called Relativistic (RTI) or Possibilistic (PTI), which holds that quantum wave functions do not move so much in the physical universe, but rather that they exist as “possibilities” in the multidimensional Hilbert space, from which transactions in the “real” universe emerge. Kastner proposes to regard the outgoing supply waves and the many incoming confirmation waves as "possible" transactions, existing outside space-time, only one of which becomes empirically "real". He suggests defining them with the term “potentia” —with which Aristotle called the ability to be something in the future—, in line with the statement of the German theoretical physicist Werner Heisenberg: “Atoms or elementary particles are not real in themselves; they form a world of potentialities or possibilities, and not so much a world of things or facts or data”. In this sense, she Kastner says that the waves of offer and confirmation are sub-empirical and pre-spatio-temporal "possibilities" — that is, they have not yet appeared in space-time— and, therefore, she calls them "incipient transactions".

Kastner calls for a new metaphysical category to describe those "not quite real possibilities", which, far from being mere abstractions, constitute a world of higher dimensions whose structure is described by the mathematics of quantum theory. She raises the need to consider such "possibilities" as part of a reality that encompasses much more than what is contained in space-time. In fact, spatiotemporal events are products that emerge from the transaction processes—timeless and non-local—that take place in the quantum realm. The metaphor of the “iceberg” used by Freud to describe the human subconscious can be equally applied to the “ontological realm of possibilities” or “quantum earth” that Kastner posits. The "quantumland" refers to the mass of the iceberg that exists below our sight, while the tip, the space-time appearance, is only a small part of all that is the physical universe. Quantum processes, even if they take place outside of space-time, are a fundamental part of that universe.

Kastner's approach to an "ontological realm of possibilities" from which the concrete spatiotemporal world emerges fully coincides with our proposal of a potential relative reality of harmonic sounds that is rhythmically actualized along the successive steps of the evolutionary ladder. In the same way, there is a clear resonance between this idea and the postulate of the physicist David Bohm about a fundamental reality —the “implicate order”—, in which matter and spirit are unified, which unfolds, instant after instant, like the manifested universe —the “explicate order”—.

Starting from the surprising data of quantum physics, Bohm proposes the existence, at a very deep level, of an intrinsic order that, beyond space and time, involves the entire cosmic reality of relationships. This intrinsic order would be projected at each instant into the manifest order, which, in turn, would be injected or introjected again, at each instant, into the intrinsic order. Bohm calls this continuous unfolding and folding between the implicate order and the explicate order “holomovement”, which constitutes the basic dynamic phenomenon from which all events of manifested reality in space-time emanate. There is no "thing" in the universe. Everything is "process". What we call things, objects or entities are mere abstractions of what is relatively stable in the processes of movement and transformation. In the implicate order, reality is ordered according to a hierarchy in which each particular level of time has its level of eternity. What is fundamental in the implicate order is the simultaneous presence of a sequence of many degrees of involvement, while, on the contrary, in the explicate order all these degrees are present in an extended and manifest way.

Concepts such as "non-local reality", "entanglement" or "non-separability", so frequent among scholars of the quantum world, point in the same direction. From the mental experiment proposed by Albert Einstein, Boris Podolsky and Nathan Rosen in 1935 — the so-called “EPR paradox”—, from the theorem proposed by John Bell in 1964 —the so-called “Bell inequalities”— and from the real experiment carried out by Alain Aspect in 1982 —and many others in later years— it became evident, beyond the shadow of a doubt, the existence of events that violated the “locality principle” —the assumption that two objects far apart cannot influence each other each other instantly— confirming, thus, the dreaded "spooky action at a distance" that Einstein feared. From then on, quantum mechanics rejects the locality principle due to the so-called “quantum entanglement”. Entanglement is a phenomenon in which the quantum states of two or more objects must be described by a single state that involves all objects in the system, even when the objects are spatially separated. A set of entangled particles cannot be defined as if they were separate individual particles, but must be defined as a single wave function for the entire system. Since the entire cosmos was fully united at the time of the Big Bang, it could well be defined by a single wave function in which the entire range of possibilities would already be present in an overlapping manner from its origin. At a quantum level, therefore, a unified vision of universal reality begins to emerge, in which, beyond space and time, all possibilities —potentialities— are present from the very initial moment. The spatio-temporal universe, from this perspective, would be nothing more than the gradual actualizing, instant after instant, of those original potentialities in a broken down manner.

This approach to a unified potential reality, beyond space and time, has not only been developed by researchers in the objective world of energy, but also by researchers in the subjective world of consciousness. Thus, for example, the psychiatrist Carl Jung took up the medieval expression “*unus mundus*” —one world— to suggest the existence of a unified underlying reality from which everything emerges and to which everything returns. He asserted that it was extraordinarily likely that mind and matter were but two different and complementary aspects of that transcendental *unus mundus*. Jung, together with the physicist Wolfgang Pauli, revealed that the concepts of "archetype" and "synchronicity" reinforced precisely the existence of that underlying unit.

Jung observed that the deeper layers of the psyche lose their individuality —become more collective— and that in this "collective unconscious" there are primordial dynamic patterns, which he called "archetypes." These archetypes are, in themselves, empty elements, virtualities, ideas in the Platonic sense, innate tendencies, models devoid of content from which individual variations are formed. An archetype possesses, in principle, an invariable significant nucleus that determines its mode of manifestation, but the way in which it is expressed in each case does not depend only on it, but also on the material of the phenomenal world with which it counts to make itself visible. The archetypes are not properly psychic elements, nor are they material, but rather psychophysical realities belonging to the field of the "psychoid", prior to an eventual separation into those two domains that we perceive to be divided in our daily reality. The archetypes would form part of that *unus mundus* which, according to scholastic philosophy, potentially contained matter and spirit and, therefore, could be understood as a kingdom of "spiritual matter" or "material spirit".

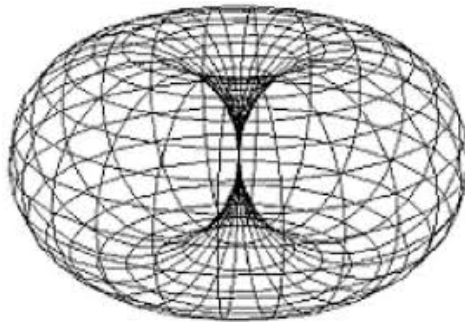
The existence of this fundamental psychophysical reality can also be demonstrated through the phenomena of "synchronicity", in which coincidences or concordances appear —beyond mere chance— between a psychic event and another physical one without there being a causal relationship between them. These surprising phenomena would be easily explainable if both the observer and the concurrent event proceeded, ultimately, from the same source, from an underlying unity common to both, from the fundamental *unus mundus*. The simultaneous expressions in the domains of the psyche and matter that take place in synchronicities suggest the existence of a single psychophysical whole that we observe through two different pathways. This whole appears as material, if it is observed from the outside, and as psychic, if it is observed from the inside, but in itself it is neither psychic nor material, but entirely transcendent. The hypothesis of a deep potential matrix, beyond any type of division in these two domains that we perceive as separated in everyday reality, thus builds a bridge between the physical world and the mental world. Synchronistic phenomena are understood, then, as double and spontaneous manifestations of that unknown foundation that is the basis of matter and mind, of energy and consciousness.

Resonating with the idea that we have raised to equate our "potential relative reality" with Bohm's "implicate order", with Kastner's "quantumland" or with Jung's "*unus mundus*", the psychologist Marie-Louise von Franz affirmed that it was possible to apply Bohm's terminology to Jung's ideas in such a way that archetypes could be seen as dynamic and unobservable structures of the implicate or infolded order. Or, in the same vein, the psychiatrist Stanislav Grof has proposed that "in an extended version of the holonomic theory, archetypes could be understood as *sui generis* phenomena, as cosmic principles intertwined with the fabric of the implicate order."

Starting from these suggestive parallels, and considering synchronicity phenomena as double and spontaneous manifestations —material and psychic— of a unified underlying reality, one might suspect that archetypes could play a key role in the process of evolution, since it is characterized —as the paleontologist Pierre Teilhard de Chardin stated— by the tendency of matter over time to acquire more complex forms of organization and, simultaneously, by the increase in the level of consciousness in those organisms. Jung himself, glimpsing this possibility, affirmed: "One cannot imagine how

much chance and how many risks were necessary during thousands of years to make a man out of a lemur. In the midst of this random chaos, there were probably synchronistic phenomena in action, which, in the face of the known laws of nature and with their help, allowed us to build, in archetypal moments, syntheses that appear to us as extraordinary."

For Jung, synchronistic events appear when some archetypes are deeply involved in a lived situation. These archetypes are then constellated in the psyche, while very strong affective and emotional dynamics are unleashed. This circumstance can be observed, above all, in very serious crisis situations, and is well known by psychotherapists. In the words of the biologist Hansueli Etter: "If we transpose these observations analogically to the level of phylogeny, we can say that archetypal situations are effectively constellated when a collective and biological crisis imminently threatens a given species or several species. At those particular moments, synchronistic events must be very numerous (that is, mutations or gene redistributions must take place within populations), so that they offer the species the possibility of superior development. It seems to me that in those events considered until now as fortuitous, we must see synchronistic phenomena."



### C) Spatio-temporal relative reality

In a previous addendum we have outlined the basic characteristics of toroidal dynamics through which the potential reality of the unmanifested foundation is actualized and unfolds in the world of forms. This process is very similar to the "holomovement" proposed by Bohm between the "implicate order" and the "explicate order". The departure and return, instant after instant, from and towards the non-dual foundation, through its finite and fleeting manifestation in space-time, allows to actualize, one after another, the successive potential levels of stability of the spectrum of energy-consciousness—that is, the entire hierarchy of "harmonics" generated at the same original moment—, starting with the most basic ones—prioritarily energy—and ending with the highest ones—prioritarily consciousness—. At each turn, the particular potential of a certain level of the spectrum is projected at a specific point-instant of pixelated space-time, it integrates with the aspects that have already emerged in previous heights, and immediately, that specific information is introjected into the field of collective memory that is generated in the foundation. When this entity has deployed the full potential of the stratum in which it basically operates and has integrated it with

everything that has emerged in the preceding stages, having reached a specific level of complexity, it can resonate with the next "harmonic" of the spectrum of energy-consciousness, and thus ascend to a new rung of the long ladder of evolution. And so on.

This intrinsically creative recursive dynamic between the “potential reality” and the “actualized reality” is mediated by that unified field of memory that, step by step, is gestating at fundamental level. All the information collected at any point-instant of the manifested world is immediately introjected into the basic field of collective memory, which, in this way, increases, moment by moment, its potential. According to our approach, with the original polarization of the fundamental non-dual Emptiness, as an objective pole —basically of energy— and a subjective pole —basically of consciousness—, a vast spectrum of balances of energy-consciousness is automatically generated between both polar facets, which runs the gamut from the most basic states —of enormous energy and little consciousness— to the highest —of little energy and enormous consciousness. "Before" the emergence of the manifested universe, this potential spectrum had a basically archetypal character —in our research we have talked about the chromatic range, the pythagorean circle (spiral) of fifths, the series of chakras...—, but from the moment the original Big Bang singularity occurs, the toroidal dance between potential reality and manifested reality begins —between the implicate order and the explicate order—, in which the game of projections and introjections that we have just discussed. It is precisely this toroidal game that, instant after instant, converts the original archetypal levels of the spectrum of energy-consciousness into fields of collective memory that are more and more solidified with each turn of the dance. This is the reason why, at present, the behavior of the most basic levels of the spectrum of energy-consciousness in the manifested universe —the material levels— is very predictable, and why, consequently, we can describe the physical laws of nature quite accurately. On the contrary, the highest levels of the potential spectrum have not yet been barely actualized in space-time and, therefore, today they still maintain their character of archetypal lightness and are difficult to describe.

Before continuing with our exposition, we would like to refer at this point to the work of other researchers who also propose the existence of a field of collective memory at the foundation of reality, with great similarities to the one we are proposing here.

For example, systems philosopher Ervin Laszlo postulates the idea of an information field as the substance of the cosmos. Using the Sanskrit term *Akasha* —with which the Hindu tradition designated the foundation that underlies all things and becomes all things— Laszlo calls this field of information the "akashic field". The *Akasha* —he affirms— is a dimension in the universe that not only underlies all the things that exist in it, but also generates and interconnects them, conserving the information they have generated. It is the matrix of reality, the network of the world, the memory of the cosmos. Akashic cosmology conceives of the universe as an integral system that evolves in the interaction of two dimensions: a hidden or akashic dimension and an observable or manifest dimension. According to this model, the hidden dimension “in-forms” the manifest dimension, and this, in turn, “de-forms” the hidden dimension, modifying its information potential. This two-way interaction between the two dimensions constitutes a continuous loop of action and reaction, creating progressive

coherence in the manifest dimension, and accumulating increasing information potential in the hidden dimension, all of which, according to Laszlo, may explain why our universe, against all odds, is well configured to form galaxies and sentient life forms, and why evolution is an informed, not a random, process.

For his part, the biochemist Rupert Sheldrake proposes a dynamic similar to Bohm's holomovement in which implicated and non-local morphogenetic fields channel the collective memory of forms and behaviors to subsequent generations. Sheldrake places special emphasis on the idea that the explained order, in a way, enriches the implicate—time enriches eternity—, because the finite contributes to the global order by re-injecting its contributions back into the whole. Each moment is a projection of the whole, but that moment is introjected back into the whole. The next moment implies, in part, a re-projection of that introjection, and so on. In this way, as each instant contains a projection of the re-injection of the previous instants—which constitutes a certain form of memory—it resembles its predecessors, but it is also different from them. According to this concept of projection and introjection, all of the entities in the universe are contributing to the deepest intrinsic nature, because we participate in the introjection of the manifest order into the implicate order, thus creating a higher order that, instant after instant, shapes evolutionary dynamics.

Similarly, the theoretical physicist Nassim Hamein posits a fundamental domain of information from which everything arises and to which everything returns. Non-local intercommunication, beyond any frame of space and time, is possible thanks to the unified spatial memory network formed by microwormholes of the basic holographic information field on the Planck scale. Memory and the recursive processes of feedback and feedforward information from the quantum vacuum—or holo-field—enable learning and evolutionary behavior. The flow of dynamic information to and from that field can be the generative source of organized matter, of self-organizing biological systems, and ultimately of self-aware entities. Hamein asserts, in summary, that we live in a highly intertwined and interconnected universe where a fundamental field of information, shared across all scales, drives evolutionary mechanisms in which the environment influences the individual and the individual influences the environment, into a non-local interconnected whole: a universe that is ultimately One.

Returning to the exposition of our proposal, we are going to try to describe, below, the mechanism through which the potential reality is actualized in and as the manifested reality, which will give us the essential clues to outline the nature of this manifestation. As we have explained, with the original dualization of non-dual Emptiness in the form of an objective pole (basically of energy) and a subjective pole (basically of consciousness), an integral, simultaneous and entangled spectrum of energy-consciousness automatically appears between the two extremes in different balances, which constitutes the **potential relative reality** or basic archetype that, later, will manifest as **actualized relative reality** or evolutionary universe. The tension generated between both extremes after the original polarization creates an expansive and entropic current coming from the pole of energy and a contractive and syntropic current coming from the pole of consciousness, which travel, in opposite directions, the entire spectrum of potential levels of stability, standing waves or musical harmonics that we have talked about. The initial instant of the universal manifestation—Big Bang—took place when

the ascending and descending flows resonated with each other at the most basic level of the energy-consciousness spectrum and, with this “handshake” between them, the “collapse of the wave function” of the first potential archetype—or musical harmonic—was produced in the world of forms. Since then, the toroidal game of projections and introjections, instant after instant, has gradually unfolded in the explicate order the successive potential levels of stratified stability of the implicate order in which the ascending and descending flows have been resonating. This iterative dynamic, as we have seen, has been converting the original archetypal levels of the energy-consciousness spectrum into morphogenetic fields of collective memory that are more and more solidified with each turn of the dance, beginning with the most basic rungs of the evolutionary ladder. The highest rungs still maintain their primeval archetypal lightness.

It is important to remark, here, that the fertile interaction between the primary poles of energy and consciousness, through the ascending —entropic— and descending —syntropic— flows, does not take place in the manifest world, but in the underlying potential reality, more beyond space and time. It's an instant interaction. Not temporary. Sometimes, when describing this bidirectional dynamic, one speaks incorrectly of a flow that advances in time and a flow that goes back in time, but it would be more accurate to think, rather, of a transaction between different depths of a single **eternal Now**, which encompasses in itself the totality of “time”. When this transaction “collapses” in a **fleeting now**, the memory of past moments and the expectation of future moments makes us conceive the image of a time line. But it's just an image. The manifested universe arises and disappears, instant after instant, from and to the underlying, entangled and unified potential reality, which is always Now. Given that the toroidal game of projections and introjections between the potential and manifested realms of reality unfolds, gradually, more and more complex forms each time—due to the fact that they integrate a greater number of levels of the stratified field of collective memory that is developing—, we can glimpse in the universal process a clear “arrow of time” that is oriented, precisely, towards the creation of progressively complex organisms and with increasing levels of consciousness. But that does not mean that there really is a real time line, only that this is our imaginary way of ordering the partial data—the frames of the world film—that we successively capture. Well, as the physicist Erwin Schrödinger affirmed: “the fact that something propagates in space or that something happens in a well-defined time of 'before and after' is not a quality of the world that we perceive, but belongs to the perceiving mind that (somehow in his current situation) he finds himself unable to register anything that is offered to him if it is not according to this spatio-temporal scheme.”

It seems that the world that we are beginning to glimpse lacks the solidity that we naively assumed, and that, in reality, it is more like a surprising and gigantic evolutionary hologram. Let's see. A hologram is a type of three-dimensional representation that is produced when *a laser ray splits into two distinct rays. One of them is bounced off the object to be photographed, and then the second ray, coming directly from the source, is allowed to collide with the reflected light from the first, producing an interference pattern that is recorded on a plate.* When a light passes through this plate, *a three-dimensional image of the original object automatically emerges that lacks the slightest substance.* It is pure appearance. Another surprising fact



is that, unlike what happens with normal photographs, *each part of a holographic plate contains the complete information of the whole*. Thus, if a holographic plate is broken into pieces, each piece, no matter how small, can be used to reconstruct the complete image of the photographed object, with greater or lesser definition. Each part contains the whole!

According to our approach, the gestation process of the universal manifestation begins with the original bifurcation of the non-dual Lucid-Light —“*a laser ray is divided into two different rays*”— into an objective pole (basically of energy) and a pole subjective (basically of consciousness), with the consequent interaction between the ascending and descending flows that are generated between them. Let us remember that, due to the toroidal dynamics of projections and introjections, the most basic levels have developed very solid morphogenetic memory fields, while the highest levels still maintain their original archetypal lightness. For this reason, the upward flow crosses very defined morphogenetic fields —“*one of them is bounced against the object to be photographed*”—, while the downward flow comes directly from the subjective pole —“*the second ray comes directly from the font*”—. When both flows resonate and interact with each other, the transaction is sealed with a handshake or standing wave —“*the second ray (...) is allowed to collide with the reflected light of the first, producing an interference pattern that is recorded on a plate*”—, and the potential collective memory collapses into a specific, punctual and fleeting formal image —“*a three-dimensional image of the original object automatically arises that lacks the slightest substantiality*”.

Our research has revealed the complete parallelism between the phylogenetic and ontogenetic processes of the human being. Both global evolution and individual development take place in the same time frame, with an identical pattern of unfolding and folding between the original and final poles, and going through exactly the same stages or levels of stability. Each individual life recapitulates, then, the entire global trajectory traveled by their ancestors —“*each part of a holographic plate contains the complete information of the totality*”—. Everything seems to suggest that the universal manifestation has holographic characteristics and that the "whole" and the "parts" are mere reflections of a common underlying foundation. Bearing in mind that a characteristic of holograms is that the smaller the size of the piece of plate used, the blurrier the reconstructed image is —definition is lost, but the integrity of the image is maintained—, we could well propose that the more complex is a given organism —the more levels of manifestation it has integrated— the greater the degree of clarity and definition of the total original image. If this approach is valid, an atom, a molecule, a cell, a mammal, a primate, or a human being, each one of them possesses, in its innermost depths, free access to the totality of the unified field of collective memory of the cosmos, although, depending on their specific characteristics —depending on their respective capacities to capture and express that plenitude that underlies and surrounds them—, it only connects with certain facets of that field.

According to everything exposed up to here, the exclusive protagonist of the creative dance of the universe is the simple non-dual Self-Evidence always present, the ultimate identity of everything and everyone, the only unquestionable reality of existence. This pure Certainty-of-Being, obvious but invisible, needs to unfold polarly as subject and object in order to be able to see itself, partially, in infinite ways. As we have explained,

the fertile interaction between the bidirectional flows that are generated between both poles is reflected —collapses— in an endless number of subject-objective, finite and fleeting holographic images, with which Self-Evidence identifies, instant after instant, being able, in this way, to contemplate with progressive clarity in the world of forms his own original invisible face.

The non-dual absolute Reality —Self-Evidence— is timeless. Potential relative reality —the implicate order, the archetypal *unus mundus*—, that is, the entirety of the polar, entangled and unitary spectrum of energy-consciousness occurs in an eternal Now, encompassing the entirety of “time.” The manifested relative reality, the space-time holographic image, is born and dies every moment. The entirety of the world of appearances is being created now... and now... and now... In summary, the timeless Self-Evidence is projected through the integral Here-Now of the potential archetype, identifies with each and every one of the point-instant of pixelated space-time, it contemplates itself from a certain perspective, and immediately returns to its original plenitude... from which, in truth, it had never left.

There are no independent objects. There are no separate subjects. Everything in the manifest world is subject-objective. Ultimately, everything is an expression of the basic interaction between the original poles of energy and consciousness in which the ever-present fundamental Self-Evidence bifurcates. The universe has no particular shape. Everything is relational. The presumed objective perceived world is just an image generated by identification with a particular subjective form. There are colors because there are eyes. There are sounds because there are ears. Everything that you are perceiving, dear reader, in yourself and in your environment at this moment, is just a spontaneous and fleeting image that arises from the interaction between the Subject pole —in “you”— and the Object pole —in “everything your environment”—, in which the Self-Evidence that you truly are branches off, from instant to instant, to contemplate Itself in infinite ways. Everything is happening by itself. Eternally. You can relax. Enjoy the dance!

Before finishing this addendum, we would like to underline that this non-dual worldview that we are proposing —which, needless to say, clashes head-on with the materialist paradigm still in force— is capable of resolving, simply and without artifice, some of the essential enigmas to which conventional science has not been able to give a convincing answer. Let's briefly review some of them.

—**The hard problem of consciousness.** The cognitive philosopher David Chalmers introduced the concept of the “hard problem” of consciousness to refer to the great difficulty of explaining, from materialistic parameters, how it is possible that an —objective— physical brain, which only processes electrical or chemical signals, can give rise to *qualia* or conscious subjective experiences. From the non-dual perspective from which we are developing our research, on the contrary, the “hard problem” does not even arise, since, far from assuming that the objective world produces subjective experiences —as materialist monism does— or that subjective experiences give rise to the objective world —as idealistic monism does—, we defend that both energy and consciousness are nothing more than the polar expression of the same and unique underlying reality in which both facets are eternally undifferentiated.

—**The mind-body problem.** Closely related to the hard problem of consciousness, the mind-body problem refers to the difficulty of explaining the interaction between "inner" mental states and "outer" bodily states. How can the mind act on the brain, as evidenced, for example, in the so-called "placebo effect"? From the scheme that we are proposing, there is no such problem, since, ultimately, the "external" world and the "internal" world —energy and consciousness— are non-dual. All levels of the spectrum of manifested reality are nothing more than different balances between these two polar facets of a single fundamental reality, and therefore any interaction between them is nothing more than mere movements between different densities of the same substance.

—**The problem of downward causality.** Materialist reductionism has sought to explain complex organisms from their simplest component elements —that is, through “ascending causation”— and, for this reason, “descending causation” —exercised by the emergent properties of wholes on the properties of their lower-level constituents—, that researchers of complex systems have revealed in numerous realms of reality, has been accused of conceptual and metaphysical incoherence. According to our approach, far from there being incompatibility between both types of causality, all manifested reality arises precisely from the interaction and resonance between ascending entropic flows and descending syntropic flows, thereby simultaneously transcending the partial perspectives of reductionism and holism, integrating them into an all-encompassing non-dual vision.

—**The problem of fine-tuned universe.** This problem, like that of the anthropic principle, has arisen when it has been verified that the universe seems to have been meticulously adjusted to allow the existence of life and mind, since, if any of the basic physical constants had been slightly different, the appearance of life as we know it would not have been possible. According to the materialist perspective, therefore, we inhabit an extremely improbable universe. From our perspective, on the contrary, since all events in the universe arise from the interaction and consensus between the flows coming from the original pole of energy —from the “past”— and from the final pole of consciousness —from the “future”—, it is completely natural that, without having to resort to any external designer, already the first events of the universal process were fully coordinated and adjusted to future events. How could it be otherwise!

—**The problem of parapsychological experiences.** Parapsychology studies different paranormal psychic phenomena that do not seem to have a scientific explanation, nor do they fit within the framework of currently accepted physical laws, such as telepathy, precognition, clairvoyance, extrasensory perception, out-of-body experiences, near-death experiences or synchronicity phenomena. All this, obviously, as it is difficult to fit within the narrow framework of the current materialist paradigm, is rejected outright by a large part of the scientific community, which considers parapsychology as a mere pseudoscience. On the contrary, since the framework of our proposal is much broader, it is very likely that some of these phenomena can be easily located within it. Specifically, in the field of what we have called “potential relative reality” —Kastner's quantumland, Bohm's implicate order, Jung's archetypal world, Sheldrake's morphogenetic fields, Laszlo's akashic field or Hamein's unified spatial memory network— perhaps easy explanations can be found for many of the parapsychological experiences discussed.

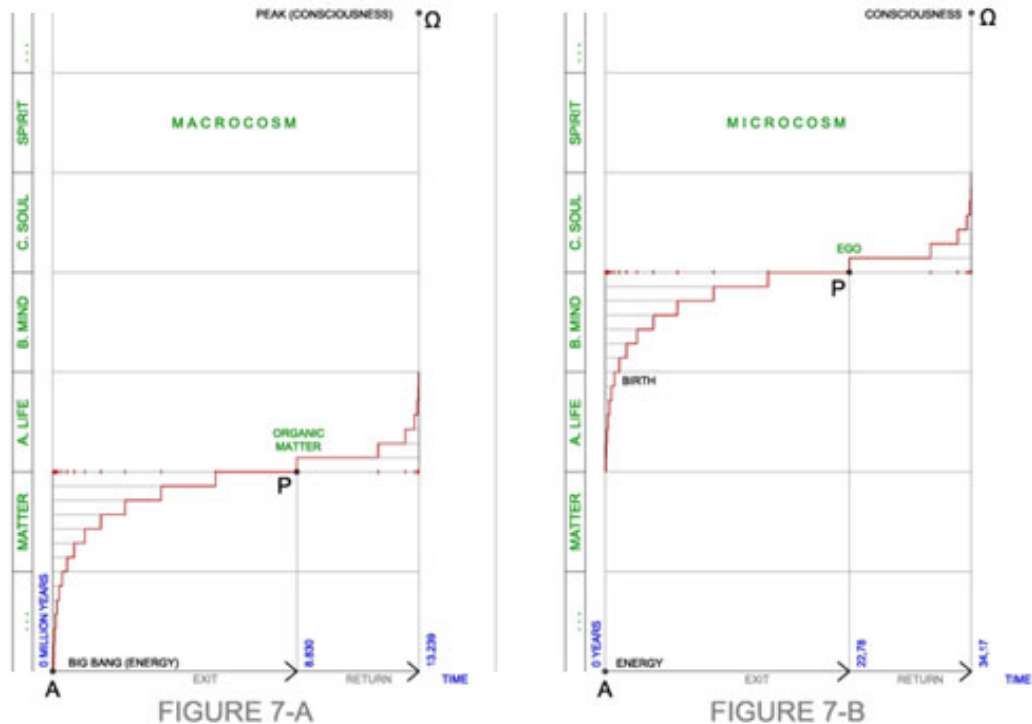
—**The root problem of science without consciousness.** Materialistic science has usually flatly rejected the claims of spiritual traditions in the name of reason. Perhaps, in principle, this attitude made a lot of sense, within the pretense of finding natural explanations for the phenomena of the world, without resorting to magical divine interventions. But, in fact, this rejection led to the unfortunate and impoverishing marginalization of an immense field of deep and rigorous investigations into the inner world, developed over many centuries in many different cultures. It is surprising to verify the enormous coherence of these experiential investigations, as has been revealed in the so-called “perennial philosophy”. We would like to highlight here, in a very special way, the non-dual schools that are present in all the great wisdom traditions: in philosophical Taoism, in Hinduism —Advaita Vedānta, Kashmiri Shaivism—, in Mahāyāna Buddhism —chan, zen—, in vajrayāna Buddhism —mahāmudrā, dzogchen—, in Judaism —kabbalah—, in Christianity —Rhenish and Castilian mysticism—, in Islam —sufism—... In all these schools we can find abundant and luminous references about of the fundamental realm that we have called “absolute non-dual reality”. It seems that the time has come to break the narrow limits of the materialist paradigm and begin to propose larger worldviews, capable of integrating, without prejudice, all the facets —interior and exterior, individual and collective— in which the unfathomable Emptiness unfolds. Perhaps, in the end, we will discover that reality—our true reality—is much more fascinating than we could ever have imagined.

(Note: The English version of this Addendum 8 is made using Google translate)

## **Addendum 9: Holographic evolution**

In this addendum we are going to present an intriguing coincidence that has arisen unexpectedly in the course of the present research about the pattern of evolution. From the outset, this enigmatic coincidence raised the question of whether it was simply a mere chance or whether, on the contrary, the matter had truly profound and revolutionary implications. The question has been hanging around for quite a few years until, recently, surprising investigations carried out in theoretical physics on the holographic principle have opened up the possibility of a fascinating solution to that intriguing synchrony that appeared fortuitously in our work.

To focus the issue a bit, we are going to briefly recall a central point of the previously developed research. If the reader has taken a look at the original text of the article *Beyond Darwin: The hidden rhythm of evolution*, they will have been able to see how a very precise harmonic-spiral-fractal pattern is revealed in the deployment process of the successive evolutionary levels of the integral spectrum of energy-consciousness that punctuates both human phylogeny and ontogeny. All trajectories start at a breakneck rhythm at their origin (A), slow down progressively as they move toward a certain level of the spectrum, and then speed up again until they reach breakneck speeds again when they start approaching the final moment ( $\Omega$ ). In Figures 7-A and 7-B we have schematized this idea:

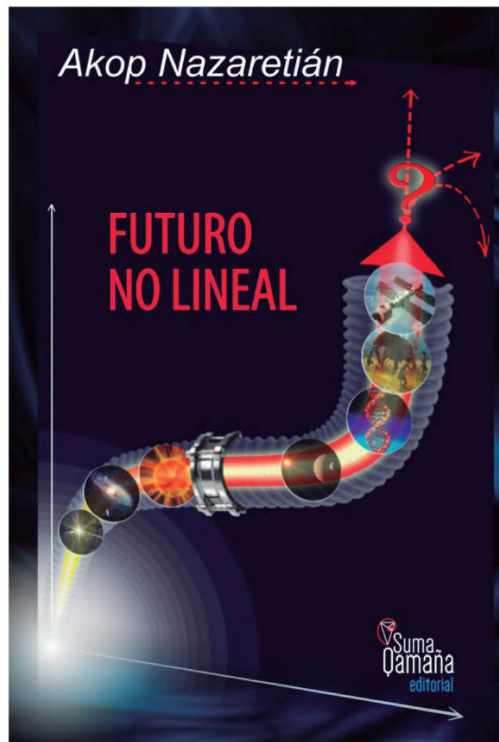


Recently, two Big History scholars, Leonid Grinin and Andrey Korotayev, have edited a book entitled *Evolution: Trajectories of Social Evolution*, which has been published in Russia by “Uchitel”. In one of its chapters, entitled *Non-Dual Singularity*, we have been able to outline the core of our research and its ultimate implications: [https://www.sociostudies.org/upload/sociostudies.org/book/evol\\_8\\_en/08\\_Faixat.pdf](https://www.sociostudies.org/upload/sociostudies.org/book/evol_8_en/08_Faixat.pdf) . Next, we reproduce the *Abstract* that heads this chapter:

*“The Universe emerged in a violent Singularity —basically of energy— generating vertiginous transformations. Later, due to cooling, the emergence of novelties slowed down gradually. After the formation of the solar system and the subsequent emergence of life on our planet, the rhythm of creative transformations began to increase progressively, first through biological evolution and, later, through human development and expansion of civilizations. Currently, the emergence of novelties is again dizzying and everything seems to indicate that we are fast approaching another imminent Singularity —basically of consciousness— of infinite creativity.*

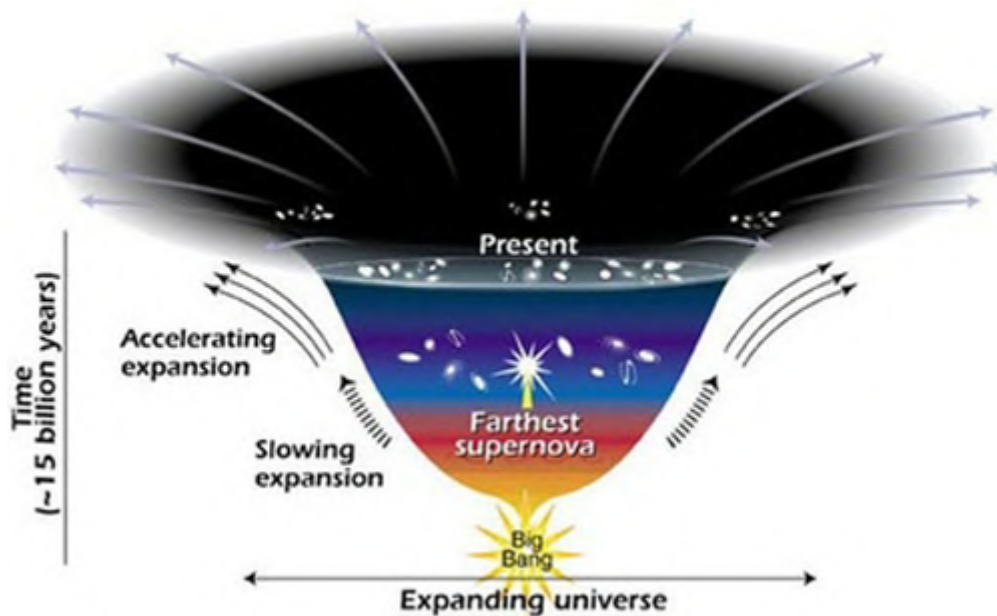
*In this paper we propose that both Singularities —A and  $\Omega$ — are nothing but the polar expression of the fundamental Void always present, ‘prior’ to its apparent dualization as energy and consciousness. The initial and final Singularities would not be, in this way, but the points of exit from and entry to this eternally self-evident non-dual Emptiness that, instant after instant, manifests itself in and as the world of forms.”*

This same evolutionary deceleration-acceleration scheme is clearly reflected on the cover of a book entitled *Futuro No Lineal —Nonlinear Future—* written precisely by another Russian researcher of Big History, Akop Nazaretyan, published in Spanish by the Argentine publisher “Suma Qamaña”:



1

Without apparent relation to all this, the American astrophysicists Saul Perlmutter, Brian P. Schmidt and Adam G. Riess received the Nobel Prize in Physics in 2011 for providing evidence in favor of the acceleration in the expansion of the universe through observations of distant supernovae. This discovery was completely unexpected, since until then it was thought that, although the universe was certainly expanding since its origin, the rhythm had been decreasing due to the mutual gravitational attraction between distant galaxies, albeit slowly due to the low density of matter-energy present in the universe. Evidence from Perlmutter, Schmidt, and Riess conclusively demonstrated that about 4.5 billion years ago —about 9 billion years after the Big Bang— the slowing rhythm of expansion reversed, and from then the universe began to expand at an ever-increasing speed, starting an era dominated by an alleged and mysterious "dark energy" that causes the "accelerated expansion of the universe". In the framework of general relativity, an accelerating expansion can be explained by a positive value of the cosmological constant, usually denoted by the capital Greek letter lambda ( $\Lambda$ ). While possible alternative explanations exist, the description assuming dark energy (positive  $\Lambda$ ) is used in the current standard model of cosmology, which also includes cold dark matter (CDM) and is known as the  $\Lambda$ -CDM model. In relation to the subject we are dealing with, we would like to point out here that, precisely, in the Wikipedia article on the "cosmological constant", the text that appears at the bottom of the initial graph is, literally, the following: "*Sketch of the timeline of the Universe in the  $\Lambda$ CDM model. The accelerated expansion in the **last third of the timeline** represents the dark-energy dominated era.*" (The bolds are mine.) Next, we include an image, also taken from Wikipedia, which clearly expresses the slowdown and acceleration phases in the expansion of the universe:



It is enough to observe the shape and chronology of the global trajectory resulting from the recently discovered expansion of the universe, to realize its complete parallelism with the shape and chronology of the global trajectory of the evolutionary process of the "macrocosm" revealed in our research. The inflection point between the deceleration and acceleration phases in the expansion process of the universe —at the beginning of ***“the last third of the timeline”***— exactly coincides with the inflection point between the deceleration and acceleration phases of the process of emergence of the successive evolutionary levels that we have analyzed in this paper, since, as we can remember, it takes place in the second node of the standing wave corresponding to the second harmonic, that is, precisely at the beginning of the *third third of the global trajectory*.

Was all this a mere coincidence or did the matter have a deeper meaning?... At first glance, it did not appear that the expansion of the universe had anything to do with the evolutionary process of matter, life, mind and spirit, through which progressively complex and conscious organisms develop, but...

Recently, reading the beautiful book *Cosmometry* by the American researcher Marshall Lefferts —from Nassim Hamein's team— I found the following text on page 120: *“Both Hamein and the cosmologist Jude Currivan propose that there is an informational aspect of universal expansion, wherein the total information content of the universe is constantly increasing, thus requiring a growing volume of pixelated spacetime within which to accommodate this informational evolution.”* And, at the bottom of that same page, I was also able to read: *“In a personal conversation with me, Currivan elaborated that in every Planck-scale moment the universe adds another set of information that is encoded into the expanding field of spacetime, and that the expansion of space and flow of time is evolution, without which there would be no evolutionary experience of consciousness.”* Eureka! At that moment I had the feeling that, finally!, the long-awaited explanation of the "mysterious" parallelism found between the accelerated expansion of the universe and the accelerated deployment of the evolution of consciousness, began to be within reach.

This new understanding of the universe that has begun to be considered in recent decades revolves around what is known as the "holographic principle", in which some of the most eminent theoretical physicists of our time are involved, such as Leonard Susskind, Gerard 't Hooft, Jacob Bekenstein, Tom Banks, Ted Jacobson, Juan Martín Maldacena or Raphael Bousso. There is now a broad consensus among physicists working on string theory and loop quantum gravity that the most fundamental scientific concept we have in physics is the holographic principle. In fact, this principle is probably the best guide we have at this time to achieve the long-sought unification of relativity theory with quantum theory.

The history of this approach dates back to the early 1970s, when Wheeler and Bekenstein tried to understand what happens to an object's encoded information when that object falls into a black hole. In the mid-1990s, 't Hooft and Susskind relaunched this research by framing black hole event horizons in terms of Planck area-sized pixels, each of which encodes a single quantized bit of information. They called this idea the holographic principle. Its basic postulate could be summarized by saying that all the information contained in a certain volume of a concrete space can be known from the codifiable information on the border of said region. In its broadest sense, the theory suggests that all the information that makes up our space-time universe would be contained in a two-dimensional surface located on the observer-dependent cosmological horizon, in such a way that the three-dimensional world we believe inhabit would ultimately be basically illusory, like a holographic image projected from the far reaches of space.

American science writer Amanda Geffer —author of the award-winning book *Trespassing on Einstein's Lawn*— has laid out with great clarity the startling logical implications of the holographic principle in the context of the discovery of dark energy and the accelerating expansion of the universe. She claims that if we want to move towards a true theory of quantum gravity —capable of unifying the general theory of relativity with quantum mechanics— perhaps we should abandon the notion that we all share the same universe and instead posit that each observer has his own universe, a complete and singular reality. Next, we are going to summarize some basic ideas that Geffer develops in her article *Cosmic Solipsism*.

According to the theory of relativity, no information can escape from a black hole, however, according to quantum theory, it inevitably has to. How to explain this inconsistency? In a flat space-time of a world without gravity all observers would agree on the definition of the objects contemplated, but when an event horizon is introduced, the (accelerated) observers outside that horizon and the (inertial) observers that who fall through it will perceive incommensurable realities among themselves. The accelerated observer will see the information radiating from the event horizon, while the inertial observer will see the information falling into it. That is, according to the accelerated observer the horizon produces particles, and according to the inertial observer, the horizon does not even exist and does not perceive any radiation in the process. Faced with this tangled crossroads, the holographic principle found a way to solve it by stating that no observer can see the inside and outside of a black hole at the same time, so that when it comes to horizons, we can talk about the world of the accelerated observer or the world of the inertial observer, but never of both simultaneously. We must, therefore, restrict ourselves to a single local point of view, because, in case of not doing so, we



would be violating the laws of physics. This radical limitation in our description of reality has been called “horizon complementarity”.

If horizon complementarity applied only to black holes it could be considered a simple curiosity, but the fact is that its field of application is actually much broader. Einstein's equivalence principle put gravity and acceleration on an equal footing: the effects of the force of gravity are completely identical to the effects of accelerated motion. Thus, if gravity can form an event horizon —as it does in black holes— acceleration can under any other circumstances as well. So, when it is space-time itself that is expanding rapidly driven by the negative pressure of dark energy —as we have seen at the beginning of this addendum—, any observer within that space-time will find themselves surrounded by an event horizon. Given, then, that the location of the horizon is always relative to the location of the observer, everything seems to indicate that quantum gravity, ultimately, does not allow a unique, objective and complete description of the universe and, therefore, it will be necessary to formulate its laws with reference to a specific observer, not more than one at a time. If we respect the complementarity of the horizon in an rapidly expanding space-time, we will have to replace an incoherent global description of reality with a local description accessible to a single observer. The existence of dark energy makes each frame of reference a universe unto itself, the end and all of reality. In other words, we may have to accept the notion that there is *my* universe and *your* universe, but there is no such thing as *the* universe.

In this same line of thought, the American theoretical physicist and neurologist James P. Kowall has delved into the holographic principle to its ultimate implications —without letting himself be carried away by the materialistic prejudices that grip many researchers—, finally reaching a revolutionary understanding of the reality that, unexpectedly, is completely in tune with the central message of all the great non-dual wisdom traditions. Next, we are going to summarize some of the ideas that Kowall exposes in the numerous and clarifying articles of his. [The reader interested in knowing the more technical details of his approach can consult the *Science and Nonduality* page: <https://scienceandnonduality.wordpress.com/> ].

The holographic principle is a radical idea that things do not actually exist in three-dimensional space, but that the appearance of things in any region of space is a holographic projection from that region's two-dimensional bounding surface to the point of view of a central off-screen observer. The observer's horizon thus acts as a holographic screen that encodes the entangled qubits —quantum bits— of information about all the things the observer can see in that bounded region of space. The expression of dark energy allows the universe to expand and cool as entropy increases, the cosmological constant changes to a lower value, and the observer's cosmic horizon increases in radius. This is how more information qubits are encoded for the universe as the observer's cosmic horizon increases its surface area.

The bounding surface of space arises naturally as an event horizon every time the observer enters an accelerating frame of reference, like a cosmic horizon that arises every time dark energy is spent and space appears to be expanding at an accelerating rate from the point of view of the observer located at the center of the singularity. The nature of observation is thus reduced to three components: *the bounding surface of space*, which arises in the observer's frame of reference and acts as a holographic screen, *the observer's consciousness* at the central point of view of that limited region of

space, and *the holographic projection* of the images of all things that the observer can contemplate. These things, therefore, do not really exist in three-dimensional space, but arise from the configuration states of the information encoded on the observer's holographic screen and are therefore nothing more than mere virtual images projected from that screen. The observer, ultimately, is only the perceptive consciousness present at the central point of view, that is, a single point of consciousness.

The whole process of observing can only start when *the energy* is spent and *the observer* enters an accelerated frame of reference. If this does not happen, there is no observation of anything. There can be no creation without perception. Creation and perception are simultaneous events. The state in which no energy is expended is the state of a freely falling observer, in which there is no acceleration and no boundary surface of space, and therefore in which nothing is observed. In fact, modern cosmology reveals that the total energy of the observable universe is exactly zero. This is possible because the negative potential energy of gravitational attraction can cancel all forms of positive energy such as dark energy, mass energy, or kinetic energy. Ultimately, therefore, nothing really exists. The apparent existence of everything is simply an illusory manifestation of nothingness. The space-time totality is, finally, this holographic disguise of nothingness appearing as something.

There are three big questions: where does the observer's *consciousness* come from?, where does the *energy* inherent in the observer's accelerated frame of reference come from?, and where does the *information* encoded on the observer's holographic screen come from? The perceiving *consciousness* of the observer, viewing his own holographic world from that world's central vantage point, and the expression of dark *energy*, placing the observer in an accelerated frame of reference that creates that holographic world, arise together, simultaneously, from the true vacuum state. The emptiness of nothingness or the true state of emptiness that gives rise to the creation of the *physical universe*, is also the primordial nature of the *perceiving consciousness* of the observer who contemplates his world. Emptiness is not only the potentiality *to create* all things, but also the potentiality *to perceive* all things. The observer's consciousness cannot arise in a brain within a body, since a body is simply another perceptible thing in that world, no more real than a holographic image projected from a screen to the observer's central point of view. The source of the observer's *perceiving consciousness* must be the same void of nothingness that gives rise to the creation of the observer's *perceptible world*. This void of nothingness is limitless and, for lack of a better description, we could call it limitless consciousness. Somehow, this nothingness is also infinite unity, undifferentiated and formless. Emptiness is the primordial or ultimate nature of existence.

Correctly interpreted, the holographic principle tells us that the physical world is only an expression of the potentiality of the void. Through its geometric mechanisms, the void has the potential *to create* a world for itself and *to observe* that world from its central vantage point. The observer and the holographic world of him always arise together in a subject-object relationship of perception. There is no objective physical world out there, but everything emerges in a subject-object relationship that occurs when the observer enters an accelerated frame of reference and their event horizon emerges, acting as a holographic screen when encoding qubits of information. Whatever the observer beholds is both an objective reality and a subjective reality. There is no way to remove the subjective observer from the observation. Everything that can be

perceived in the world, which quantum theory refers to as an observation or measurement of the world, occurs in a subject-object relationship. By its very nature, the quantum state of *potentiality* is an unobserved state until it is observed, at which point it is reduced to an observed state of *actuality*. It just doesn't make sense to talk about the quantum state as an objective physical reality. The quantum state is just a state of potentiality. It describes what can probably be observed, not what is actually observed. When the observer focuses their attention on their own holographic world, the observer's consciousness becomes focused on one point of view and the observer's holographic world appears to come into being. The observer's holographic world can only appear to come into existence when the observer focuses their attention on that world. The observer must be present as a presence of consciousness at the center of his own world for that world to appear to exist.

Unifying quantum theory with relativity theory is the problem of making sense of the observer in both theories. Relativity speaks of the observer observing or measuring the relativistic properties of their objects in an accelerated frame of reference, whereas quantum theory speaks of the observer observing or measuring the quantized properties of their objects as those properties arise from a quantum state of potentiality. The key point is that these observations always occur in the subject-object perception relationship. Neither quantum theory nor relativity theory really has anything significant to say about the nature of the observer, other than that the observer sees some property of an object in a subject-object relationship. The problem that physicists seem unwilling to face is that everything perceptible arises in a subject-object relationship when the subject perceives some observable property in an object. The only logical conclusion that can be drawn from all this is that not only the *perceptible object* arises from the void state as an excitation of energy and information, but the *perceiving subject* also arises from the void state. This tells us fundamentally that the vacuum state is not only the source of all the energy and information inherent in objects, but also the source of the consciousness that perceives the properties of all those objects. The triad of energy, information and perception of consciousness have to arise together in a subject-object relationship of perception, and they do so simultaneously from the state of emptiness.

The origin of universal manifestation occurs when the void is projected as the perceiving consciousness of all observers present at the central point of view of their own holographic worlds. The only reason different observers view different worlds is because each observer is located in its own coordinate system that moves relative to other coordinate systems. In any case, the perceiving consciousness in each and every one of the determined points of view is the same and unique consciousness, only that, being located in different points of view, it contemplates different universes. Each observer has his own bubble and is at the center of his own world. The various observers do not exist within the same world, but each have their own world defined on their own viewing screen. How, then, can one explain a consensual reality shared by many observers, each present at the central point of view of their own holographic world? The answer lies in the fact that when their holographic screens overlap, they can share information. Information encoded on one display screen is correlated with information encoded on another screen due to quantum entanglement. Each display screen defines an information state that includes all the possible ways that information can be encoded in all the different pixels. What seems to happen in any one bubble is connected to what seems to happen in the other bubbles as bits of information in those different states of information interact with each other, align, and share their content.

Holography demonstrates that consensus reality is made up of multiple interlocking worlds, each defined on its own viewing screen and each viewed from its own point of view. Consensus reality is not a single objective reality, but many intertwined worlds that share information with each other. The quantum state of potentiality of the universe is a sum of all the bubbles in the vacuum.

Every time an observer makes an observation of something in your holographic world, the tangled information encoded on your holographic screen is disentangled and the quantum state of potentiality is reduced to an actual observed state. Until observed, everything in that holographic world only exists at the level of entangled qubits of information encoded on the observer's own holographic screen. Each observation is thus a perceptible holistic event in which the entangled quantum state of that holographic world is disentangled, and thus the observation of anything in that world affects the observation of everything else. The coherent organization of the form develops naturally because all the information qubits encoded on the observer's holographic screen are entangled and those entangled information qubits tend to align. The coherent organization of information allows the development of observable forms of information, which self-replicate over a sequence of events. In the sense of quantum theory, each event is a decision point where the quantum state of that world bifurcates, due to the different ways that bits of information can be encoded across all the pixels on the display screen. The observed events of that world are not predetermined, but rather encoded in a quantum state of potentiality, best understood as the sum of all possible paths.

For an integral understanding of the holographic world, it is essential to highlight the distinction between unlimited consciousness—which is the nature of the undifferentiated void that has the inexhaustible potential to create endless finite worlds of forms—and limited consciousness—which is the nature of an individual observer and his observed world—. This limited consciousness arises from the illusory self-identification of the unlimited consciousness with the central character of a given movie. This is a peculiar aspect of existence in a holographic world. The fact that the observer places the focus of attention on the life of his character is what creates the hypnotic spell of self-identification. With personal self-identification, there is the mistaken assumption that the source of the observer's consciousness is that central character appearing in the perceived holographic virtual reality world, which is logically impossible. The observer's body is just one more form of information that appears in his holographic world. When the observer emotionally identifies with a body and takes himself as such, it is as if that body were the subject in the subject-object perception relationship. The observer's body is taken as the perceiving subject, and all other objects that appear in the observer's holographic world are considered as objects of perception. In reality, the observer himself is the subject, and his body is just another object of perception that appears in his holographic world among all other objects of perception. Behind all this illusory game of self-identifications, the ultimate reality is that there is only one consciousness in everyone, but there are many different points of view within that consciousness, each perceiving their own mind and their own world on their own screen. As we have said, the observer must be present so that the quantum state of potentiality can be actualized, from instant to instant, as a concrete state of the manifested world. Thus, when the observer is no longer present, his world and his mind disappear from apparent existence and his limited consciousness returns to the undifferentiation of unlimited consciousness. As Nisargadatta Maharaj stated: “*All*

*limited existence is imaginary. Even space and time are imaginary. The pure being, which fills everything and beyond everything, is not limited. Only the limitless is real."*

Having outlined so far the basic characteristics of the holographic principle, as well as its solipsistic implications, exposed by Amanda Geffer, and its non-dual implications, revealed by Jim Kowall, we believe that we already have the necessary tools to clarify the intriguing parallelism found between the accelerated expansion of the universe and the accelerated unfolding of the evolution of life, which we have raised at the beginning of this addendum. To focus the issue, then, we are going to summarize below some basic points that we have developed in previous addenda or in the initial article.

In order to reach a truly integral understanding of the subject we are dealing with, it is completely necessary to refer to at least three different facets in the All-One: non-dual absolute reality, potential relative reality, and spatiotemporal relative reality.

—**Non-dual absolute reality:** Since all manifested reality inexorably appears in the form of interdependent dualities —subject/object, inside/outside, origin/end—, we can understand them as polar manifestations of a reality that transcends them and that it is “prior” to that dualization. Physicists speak of infinite potential energy in the original quantum void, and sages speak of infinite transparent consciousness in the final mystical void. Our proposal is that these two voids are the same and unique absolute Emptiness, perceived objectively by physicists and subjectively by contemplatives, but which, in itself, is neither objective nor subjective, but unity, identity or indifference of both facets simultaneously.

—**Potential relative reality:** Since non-dual Emptiness is completely devoid of the slightest separation between subject and object, it cannot be perceived in any way. For this reason, if it wants to contemplate itself, it has no choice but to unfold as an original objective pole —basically of energy— and a final subjective pole —basically of consciousness—, fully maintaining its empty essence. Between both poles a wide spectrum of balances is generated between both polar facets, which covers the entire range from the most basic states —of enormous energy and little consciousness— to the highest —of little energy and enormous consciousness—. When this illusory distance of energy-consciousness generated between both poles enters into vibration —like a guitar string— a characteristic fundamental sound and all its unlimited range of harmonic sounds (standing waves) are instantly produced. This means that, let's look closely, from the very originary moment the entire archetypal spectrum of energy-consciousness is already fully present in an entangled and resonant way. The successive second harmonics that arise with the vibration of the original "string" of energy-consciousness are, precisely, the potential levels of stratified stability that will be updated, one after the other, along the successive steps of universal evolution.

—**The spatiotemporal relative reality:** In a previous addendum we have outlined the basic characteristics of the nested toroidal dynamics through which the potential reality of the archetypal foundation is actualized and unfolds in the illusory holographic world of space-time forms. The departure and return, instant after instant, from and towards that foundation, through its finite and fleeting manifestation in and as the holographic space-time, allows one to actualize, one after another, the successive potential levels of stability of the spectrum of energy-consciousness. This intrinsically creative recursive dynamic between “potential reality” and “actualized reality” is mediated by the unified

field of memory that, step by step, is gestating at a fundamental level. All the information collected at any point-instant of the manifested world is immediately introjected into the basic field of collective memory, which, in this way, increases, moment by moment, its creative potential. The ultimate claim of the universal evolutionary manifestation consists in reproducing in a broken down and integrated way, in the world of finite appearances, the non-duality of undifferentiated energy-consciousness, characteristic of fundamental Emptiness. It is, finally, the inexhaustible attempt of Nothingness to contemplate its invisible face in infinite ways.

In non-dual absolute reality the object and the subject —energy and consciousness— are *undifferentiated*, in potential relative reality the object and subject are differentiated but *entangled*, and in spatiotemporal relative reality the object and subject they are differentiated and (apparently) *separated*. We can exemplify these three possibilities by representing non-dual absolute reality with 0, potential relative reality with a qubit (unit of quantum information) —which not only has the basic states of 0 and 1, but can be found in a state of quantum superposition, with the simultaneous combination of both states—, and to the relative reality manifested with a classical bit —which can represent one of those two values: 0 or 1, like, for example, in the case of a light bulb, which can be in one of these two states: either on or off. That is, a bit can contain a value (0 **or** 1), a qubit simultaneously contains both values (0 **and** 1), and absolute 0 lacks any type of information... or, rather, it includes everything in an undifferentiated way. The passage of potential relative reality —Kastner's "*quantumland*", Bohm's "implicate order", Jung's archetypal "*unus mundus*", Sheldrake's "morphogenetic field", Laszlo's "akashic field" or the Hara's "unified spatial memory network"—to the actualized relative reality —the holographic spatiotemporal universe that we believe we inhabit— can be schematized, as we will see below, through the interactive dynamics between the objective (energy) and subjective (consciousness) poles in which the non-dual Emptiness unfolds —the simple absolute Presence, the mere Consciousness-of-Being, the pure Self-Evidence without form, the diaphanous ultimate Identity of everything and everyone—.

What so far we have called potential relative reality bears a suggestive similarity to what students of the holographic principle know as the holographic plate. In both cases, we are talking about a potential field of entangled information that is holographically projected to the eyes of a determined observer as a space-time universe. That is to say, the holographic plate (or potential relative reality) is not located in any particular place or moment in space-time, but, on the contrary, it is the entirety of space-time that is potentially located in the holographic plate. As we have seen above, potential relative reality is the common archetype of all possible world lines unfolding in holographic space-time. All these lines of the world —the different modes of vibration of the "string" of energy-consciousness that runs through the illusory distance between the objective and subjective poles, which we have posited at the heart of our evolutionary hypothesis— start from the same original pole —basically of energy— and are oriented towards the same final pole —basically of consciousness—, but their trajectory can be "tuned" in many different ways, at any of the levels of the energy-consciousness spectrum, from the most basic or material to the highest or spiritual. In the addendum on entropic-syntropic evolution we have explained how potential retarded waves (starting from the original energy pole and flowing forward in time) and potential advanced waves (starting from the final consciousness pole and flowing backward in time) resonate with each other at a certain level of the spectrum —standing wave or musical

harmonic—, which acts as a fundamental sound, and with this "handshake" between both flows the transaction is completed —wave function collapse— that manifests itself in a concrete event in space-time. Put another way, “every time an observer makes an observation of something in his holographic world, the entangled information encoded on his holographic screen is disentangled and the quantum state of potentiality is reduced to an actual observed state.”

As we have suggested a moment ago, the passage from potential relative reality —the holographic plate— to actualized relative reality —the holographic space-time universe— can be unraveled through understanding the mutual dynamics between the objective pole (energy) and subjective pole (consciousness) in which the non-dual Emptiness is apparently dualized. The key is to understand that the separation process between both poles can be interpreted in two different ways. In one, the object moves away from the subject. In the other, the subject moves away from the object. Let's see each one of them.

From the perspective of the holographic principle, there is no objective physical world out there, but rather everything emerges in a subject-object relationship that occurs when the observer enters an accelerated reference frame and their event horizon acts as a screen holographic when it encodes qubits of information. This accelerated movement is usually interpreted as referring to the expansion of the universal bubble in the eyes of the observer located in its center. What is absolutely amazing about the observer's consciousness is that relativity theory tells us that the observer's central point of view is exactly the singularity of the Big Bang event. So, each observer has their own Big Bang event that creates their own holographic world. That is to say, all the observers of the universe are in the immovable center of the cosmic expansion and have remained there since the beginning of time. At the time of the Big Bang, the universe had a diameter of about one Planck length ( $10^{-33}$  cm), and space has been expanding outward at an exponential rhythm ever since. Each observer contemplates this accelerating expansion of the universe relative to his own point of view at the center of the universe. What we call the universe is actually an observer's own holographic world. As we have said, the expression of dark energy allows the universe to expand and cool as entropy increases, the cosmological constant changes to a lower value, and the observer's cosmic horizon increases in radius. This is how more and more qubits of information for the universe are gradually being encoded as the observer's cosmic horizon increases in surface area. In this sense, as we have commented, Haramein and Currivan explain that there is an informational aspect of universal expansion, since the fact that the total information content of the universe constantly increases requires a growing volume of pixelated space-time within which to accommodate this informational evolution.

Next to this perspective in which it is stated that the objective universe is rapidly moving away —outwards— from the observing subject, we can make another reading in which it is the observing subject that is rapidly moving away —inwards— from the objective material universe. Instead of speaking, then, of a progressive *expansion* of the objective universe, we will speak of a progressive *internalization* in the realm of subjective consciousness. To expose this alternative approach, we are going to recall here, briefly, an idea that we have exposed in our article. We can summarize the entire evolutionary process stating that in the original moment and during the first stages of development of *matter*, the facet of consciousness was absorbed in the facet of energy. With the emergence of *life*, the facet of consciousness jumps inwards, separates itself

from mere matter, perceives it, and thus can act on it. With the emergence of the human *mind*, the facet of consciousness jumps inwards again, self-consciousness appears, which is separated from the simple subconscious life, thus increasing the capacity for action on the natural world. With the emergence of the rational *intellect*, the facet of consciousness jumps inwards again, which allows us to think about thought and, in this way, the understanding of how things work and, therefore, the ability to intervene increases exponentially about them. All this process is possible due to the presence, from the very originary moment, of pure consciousness —the “witness” of which the Hindu tradition speaks— as the final pole of the process. Therefore, it should be clarified that this final pole of pure consciousness does not evolve at all —because it remains full and immutable at all times—, but its reflection and identification with the different entities and organisms that develop throughout the process —atoms , molecules, cells, multicellular organisms, vertebrates, mammals, primates, apes, humans...— it does evolve in terms of its ability to actualize that full consciousness, which allows progressively increasing the ability of organisms to capture, store, process and respond to information from the environment. This accelerated evolutionary process has been described by the British theoretical physicist and experimental psychologist Peter Russell as a spiral movement through a "*white hole in time*", which, displaying increasing levels of complexity, connectivity and consciousness, is heading towards a next final Omega Point.

We have said before that the observer and his holographic world always arise together in a subject-object relationship of perception. For this reason, we propose that the two interpretations of the universal dynamics that we have just exposed —the accelerated expansion of the external world and the accelerated evolution of the internal world—, far from representing two independent realities, are, on the contrary, two complementary descriptions of a same and unique process. When, at the beginning of this addendum, we highlighted the surprising synchrony between the process of expansion of the universe and the process of evolution of life, we suggested that, at first sight, the two phenomena did not seem to have anything to do with each other. But, once the fundamental characteristics of the holographic principle have been exposed, we have understood that these two processes are not only closely related, but that they are, even more, two perspectives on the same and unique reality. The increase in the number of information qubits as the observer's cosmic horizon expands is nothing but the objective expression of the growth in the capacity to actualize subjective consciousness in the successive organisms that unfold throughout evolution. Viewed in this way, the total formal and chronological similarity —described in the first paragraphs of this addendum— between the global expansion trajectory of the universe and the global evolutionary deployment trajectory, far from being a mere coincidence, is the expression logical and natural from the fact that both processes are only two partial perspectives of the same and unique subject-object process. So, we can say, indistinctly, that the universe expands because life evolves or that life evolves because the universe expands. Ultimately, subject and object are not two, but the simple illusory appearance through which the non-dual Emptiness tries to contemplate its eternally invisible face.

(Note: The English version of this Addendum 9 is made using Google translate)



## Addendum 10: Integral Singularity

### Abstract

For some decades now, in the field of information technology and computing, after observing the accelerated progress of technology in recent times, there has been speculation that, shortly, a point of no return will be reached—to which It has been called the technological Singularity—in which the rhythm of change will be dizzying, the acceleration curve will become vertical, and artificial intelligence will far surpass human intelligence. Some even believe that superintelligent machines, as they become the dominant species on the planet, will end up devaluing human beings until they become obsolete organisms and, in the long run, leading humanity to extinction. Our research on the rhythm of evolution and history—which reveals the existence of a very precise spiral-fractal pattern, hidden in the universal process and oriented towards a point of Singularity within a couple of centuries—, far from marginalizing human beings at that peak moment in history, they make him the true protagonist. Therefore, in this Addendum, after summarizing the key points of our research, we will try to answer some of the main questions that are being raised around the Singularity hypothesis: Will the technological Singularity really occur? When could that expected/feared moment take place? Can we truly conceive of a conscious machine? What are the ultimate implications of the Singularity? How can humanity face the process of approaching that peak moment in history?... Perhaps, in the end, we will come to glimpse that reality, our own reality, is more fascinating than we could have ever imagined.

### 1. Introduction

The transdisciplinary research that we are developing about the surprising creative dynamics deployed during the history of the universe reveals that the great evolutionary novelties that have emerged throughout the process, far from being simple contingent, fortuitous and unpredictable events, have been emerging from ordered form, according to a very precise spiral, harmonic and fractal pattern. In summary, we can speak of a double divergent-convergent spiral that, starting from the dizzying creativity of the original pole of the Big Bang, gradually slows down until reaching the moment of formation of the solar system and, from there, begins to accelerate again progressively, first through biological evolution on our planet and, later, through human development and the expansion of civilizations, until reaching the current moment, in which the rhythm of emergence of novelties is once again dizzying and everything seems to indicate that we are rapidly approaching a definitive pole of infinite creativity that will take place in a couple of centuries, around the year 2217.

When we began this research, back in 1981, the mere suggestion of the existence of a spiral pattern in the evolutionary process, and its inexorable orientation towards an imminent pole of convergence, was considered pure blasphemy for official science. The only references available at that time were far outside the academic spheres. The most relevant, from the Western perspective, was, without a doubt, the French paleontologist and theologian **Pierre Teilhard de Chardin** (1881-1955), who, observing the increase in complexity and consciousness throughout the evolutionary process—cosmosphere, biosphere, noosphere, pneumosphere—, defended the existence of a final pole of attraction—which he called the Omega Point—in which the full unification of matter and spirit would take place. And, from the Eastern perspective, the clearest exponent of

a similar approach was, without a doubt, the Indian poet and philosopher **Aurobindo Ghose** (1872-1950), who, understanding that the origin of the universe was the result of the involution of the Spirit in matter, he proposed that the entire cosmic evolutionary process was nothing more than the return movement of matter —through life and mind— towards the supramental summit, the non-dual nexus of absolute reality and the relative world.

Obviously, all these proposals clashed head-on with many of the central assumptions of conventional science, but, surprisingly, over the last decades they have begun to appear, in the environment of what has been called the “technological Singularity”, numerous works that clearly resonate with those “pseudoscientific” approaches about the accelerated and convergent dynamics of evolutionary development.

The term “singularity” is used with different meanings in various fields of science. For example, in mathematics, it can be used to refer to certain functions that present unexpected, extreme or infinite behaviors, or, in relativistic physics, it can refer to the hypothetical initial point of the universe of infinite density that gave rise to the Big Bang, or, of the likewise, it can be used to designate certain “places” in space-time — such as black holes— where fundamental magnitudes, such as curvature, become infinite because very large concentrations of matter and energy, driven by the gravitational force, they end up collapsing until they are reduced to an infinitely small point. In the field of information technology and computing, observing the accelerated progress of technology in recent times, there has been speculation that, shortly, a point of no return will be reached —technological singularity— in which the rhythm of change will be dizzying, the acceleration curve will become vertical and artificial intelligence will far surpass human intelligence, with unpredictable and uncontrollable results for civilization as we know it. Because, just as in black holes —physical singularities— it is not possible to see beyond the event horizon, in the technological singularity we cannot even glimpse what will happen beyond it because it will completely exceed our current cognitive capabilities.

Next, to familiarize ourselves in some way with the topic, we are going to refer to some of the authors who have been key to the development of this idea over the last century. We will limit ourselves only to giving some significant data from the pioneering researchers who, throughout the 20th century, have placed emphasis on the technological aspects of the process, and we will leave for later those others who have studied the topic of evolutionary acceleration —and its final asymptotic instant—from other perspectives.

## **2. Brief history of the technological singularity**

Perhaps the first theorist to speculate on the possibility of an event similar to the technological singularity was the American historian **Henry B. Adams**, who, in 1904, having noted the rapid development of science and technology throughout the 19th century, proposed the existence of a law of acceleration of progress, defined and constant like any law of mechanics. In 1909, Adams developed this idea further in the essay *The Rule of Phase Applied to History*, in which he proposed a “*physical theory of history*” by applying the law of inverse squares to historical periods, suggesting that the world may now be immersed in an inexorable acceleration towards a “*phase change*” in the relationship between technology and humanity of unimaginable consequences. In

this work, Adams statistically determined the average duration of each new phase of human history and proposed a Religious Phase of 90,000 years, a Mechanical Phase of 300 years, an Electrical Phase of 17 years and an Ethereal Phase of 4 years, which, finally, "*would push Thought to the limit of its possibilities*", suggesting that the asymptote —the singularity of the phase change— could occur at any time between 1921 and 2025.

In any case, it seems that it was the Hungarian mathematician and physicist **John von Neumann** who, in the late 1940s or early 1950s, first used the term “singularity” to describe his vision of a future runaway progression in computational events. Some time later, in 1958, the mathematician Stanislaw Ulam, recounting a conversation with von Neumann, wrote: “*One conversation centered on the ever accelerating progress of technology and changes in the mode of human life, which gives the appearance of approaching some essential singularity in the history of the race beyond which human affairs, as we know them, could not continue.*”

In 1965, British mathematician and computer scientist **Irving J. Good** —author of the book *Speculations Concerning the First Ultraintelligent Machine*— was the first to use the concept “*intelligence explosion*” to suggest that if machines were to slightly surpass human intellect, they could recursively improve their own designs in ways unforeseeable by their designers, leading to a dizzying cascade of self-improvements and a surge in super intelligence —that is, a singularity—. It appears that, years later, Good wrote in an unpublished autobiographical statement that he suspected that an ultra-intelligent machine would lead to human extinction.

It was in this same year of 1965, when the American chemist and entrepreneur **Gordon E. Moore**, co-founder of Intel, published a document in the magazine *Electronics* in which he anticipated that the complexity of integrated semiconductor circuits would double each year with a reduction of commensurable cost. Known as “Moore's law,” his prediction has made the proliferation of technology possible throughout the world. Moore updated his prediction in 1975 to note that the number of transistors on a chip doubles every two years and this still holds true today. Many authors have used this “law” to make their predictions regarding the precise moment in which the technological singularity will take place.

The Austrian robotics and artificial intelligence researcher **Hans Moravec** is, perhaps, the pioneer in the study of the acceleration of computational change in the 20th century. In a series of articles published between 1974 and 1979 (and later in his 1988 book *Mind Children*) he generalizes and expands Moore's law on the pattern of exponential growth in the complexity of integrated semiconductor circuits, to also include technologies from long before the integrated circuit up to future forms of technology. Moravec describes a timeline and scenario in which robots will evolve into a new series of artificial species, starting in 2030-2040. In 1979, Moravec's ideas reached the general public through an article titled *Today's computers, intelligent machines and our future*. In the final part of this essay “*he considers the implications of the emergence of intelligent machines, and concludes that they are the final step in a revolution in the nature of life. Classical evolution based on DNA, random mutations and natural selection may be completely replaced by the much faster process of intelligence mediated cultural and technological evolution.*” Analyzing the future evolution of computers and humans, Moravec states that we are rapidly heading towards a post-

biological form for all living intelligence and, “*in the long run the sheer physical inability of humans to keep up with these rapidly evolving progeny of our minds will ensure that the ratio of people to machines approaches zero, and that a direct descendant of our culture, but not our genes, inherits the universe.*”

At this point we want to remember that it is in that same decade, following the publication in 1977 of the book *The Dragons of Eden* —Pulitzer Prize in 1978— by the astronomer, cosmologist and scientific popularizer **Carl Sagan**, when the idea of evolutionary acceleration begins to become popular. In this book, Sagan proposes the metaphor of the “Cosmic Calendar” with which he shows that the great evolutionary novelties have been emerging in an increasingly accelerated manner throughout the last six billion years of the history of the universe. The Cosmic Calendar is a method to visualize the chronology of all universal history in which its total duration is equated with an annual calendar. The Big Bang is placed at midnight on cosmic January 1 and the current moment at midnight on December 31. In this calendar, the solar system appears on September 9, life on Earth emerges on the 30th of that month, the first dinosaur on December 25, the first primates on the 30th, the first *Homo sapiens* appear ten minutes before midnight of the last day of the year, and the entire history of humanity occupies only the last 21 seconds.

Returning to our story, we will say that the term singularity, linked specifically to the creation of intelligent machines, did not begin to be used until 1983, when the American mathematician and writer **Vernor S. Vinge** wrote a brief opinion article in the magazine *Omni* in which he said: “*We will soon create intelligences superior to ours. When this happens, human history will have reached a kind of singularity, an intellectual transition as impenetrable as space-time knotted at the center of a black hole, and the world will go far beyond our understanding.*” In 1986, Vinge pressed the idea of the exponential acceleration of technological change in the science fiction novel *Marooned in Realtime*, set in a world of rapidly accelerating progress leading to the emergence of increasingly sophisticated technologies separated by increasingly shorter intervals of time, reaching a point beyond human comprehension. Years later, in 1993, Vinge himself wrote another article, titled *The Coming Technological Singularity: How to Survive in the Post-Human Era*, which was very widely disseminated in the Internet and the idea of singularity then began to become very popular. This article contains a statement that has been cited numerous times: “*Within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended.*” Vinge refined his estimate of the necessary time scales, adding: “*I would be surprised if this event occurs before 2005 or after 2030.*”

[As a mere curiosity, we can point out that it was precisely in this year 1993 when the pioneering article of the present research on the pattern of evolution, that we are still developing in these pages, was published. At the express invitation of Ervin Laszlo, I wrote the text in 1992, with the title *A hypothesis on the rhythm of becoming*, and it came to light in Volume 36 – Number 1 – 1993 of *World Futures: The Journal of General Evolution*, pages 31-56, with three fold-out graphics (9, 12 and 17) at the end of the paper copy. The article was also published online on June 4, 2010: <https://www.tandfonline.com/doi/pdf/10.1080/02604027.1993.9972329> ].

In this same 1990s, numerous authors began to appear with works related to the topic of technological singularity. For example, the American scientist **Marvin L. Minsky** —

*Will Robots Inherit the Earth?*, 1994—, the American cultural entrepreneur **John Brockman** —editor of *The Third Culture*, 1995—, the American mathematician and computer scientist **W. Daniel Hillis** —*Close to the singularity*, 1995—, the Australian science fiction and popular science author **Damien Broderick** —*The Spike*, 1997—, the Swedish transhumanist philosopher **Nick Bostrom** —*How long before superintelligence?*, 1997—, British philosopher and futurologist **Max More** —co-founder and president of the *Extropy Institute*—, American strategic designer **Natasha Vita-More** —*Create/Recreate: 3rd Millennial Culture*, 1999—, the American futurist and prospective consultant **John M. Smart** —creator of the *Acceleration Watch* website [from which we have collected a lot of information], since 1999— [we will return to this author soon], but, perhaps, the most important fact for the massive dissemination of all these ideas has been the publication in this decade, by the American inventor and pioneer of artificial intelligence **Ray Kurzweil**, of two fundamental books: *Age of Intelligent Machines*, in 1990, and *Age of Spiritual Machines*, in 1999. In the first of them, Kurzweil examines the philosophical, mathematical and technological roots of artificial intelligence, puts highlights the astonishing growth in computing power in recent decades, and predicts the central role that AI will play in 21st century life. In the second, he broadly develops these ideas. He outlines his vision for how technology will progress in the coming years and predicts that within a couple of decades there will be machines with human-level intelligence available in affordable computing devices, revolutionizing most aspects of life. He presents his “*law of accelerating returns*” to explain why the computational power of computers is increasing exponentially and why “*key events*” occur more frequently as time passes. Kurzweil begins by noting that the frequency of novel events throughout the universe has been slowing since the Big Bang, while evolution has reached important milestones at an increasing rate. This is not a paradox, because —he writes— entropy (disorder) is increasing globally, but, simultaneously, local foci of increasing order are flourishing. Time speeds up as order increases.

Moore's law —remember— refers only to the growth of complexity in integrated semiconductor circuits. Kurzweil —like Moravec— expands the field of study and, after analyzing the development of technologies prior to that of these integrated circuits, observes that the geometric growth of processing capacity is prior to said paradigm and that, at least, it extends across four other technologies: early 20th century electromechanical equipment, relays, vacuum tubes, and early transistors. So, while he believes Moore's Law on integrated circuits will end around 2020, the law of accelerating returns will require that progress continue to accelerate, and therefore some other technology will be discovered or perfected to continue exponential growth. Kurzweil argues that whenever a technology reaches a certain type of barrier, a new replacement technology will be invented to cross that barrier, ultimately leading to “*technological changes so rapid and profound that they will represent a rupture in the fabric of human history*”.

In 2005, Ray Kurzweil published his most renowned work, *The Singularity Is Near: When Humans Transcend Biology*, through which the idea of singularity achieves full popularity in all media. Returning to his law of accelerated returns, he predicts an exponential increase in technologies such as computing, genetics —intersection between information and biology—, nanotechnology —intersection between information and the physical world— or robotics, and affirms that, a once the singularity is reached, machine intelligence will be infinitely more powerful than all

human intelligence combined. It predicts that the next step in this inexorable evolutionary process will be the union of human and machine, in which the knowledge and abilities of our brains will be combined with the much greater capacity, speed and potential to share knowledge of our creations. He explains that the rhythm of evolutionary progress is exponential due to positive feedback, in which the results of one stage are used to create the next.

According to Kurzweil, the information processing capacity has been following exponential behavior for a long time before the appearance of the latest technologies. In fact, his hypothesis is that the pattern extends throughout the entire evolutionary process, from the very origin of life —almost four billion years ago— to reaching humans and current technology. Kurzweil summarizes evolution through the ages as progress through six epochs, each of which builds on the previous one. It states that the four epochs that have occurred so far are: **Epoch 1. Physics and Chemistry:** Information in atomic structures, **Epoch 2. Biology:** Information in DNA, **Epoch 3. Brains:** Information in neural patterns, and **Epoch 4. Technology:** Information in hardware and software designs. Kurzweil predicts that the singularity will coincide with the upcoming **Epoch 5. The Fusion of Technology and Human Intelligence.** After the singularity, he says, **Epoch 6. The Universe Awakens** will occur. Kurzweil places the moment of the singularity —a profound and disturbing transformation of human capabilities— in the middle of this century, around the year 2045, because, he claims, the non-biological intelligence created on that date will be a billion times more powerful than all human intelligence today. This circumstance, in principle, does not really seem definitive enough to be considered a true singularity in the cosmological sense in which we are proposing it, and, in fact, Kurzweil himself, in this same book, states that, starting in 2045, *our civilization will expand outward*, eventually converting all the dumb matter and energy we encounter into enormously intelligent (and transcendent) matter and energy. Ray specifies that we can saturate the universe with our intelligence before the end of the 22nd century, and concludes: “*Once we saturate the matter and energy of the universe with intelligence, it will ‘awaken’, become conscious and supremely intelligent. It’s the closest thing to God I can imagine.*” So, according to this, it seems that the true evolutionary summit, the true Singularity that will imbibe the entire universe with its spirit, will not take place in the year 2045, but rather will occur at the end of the 22nd century, when all the energy and intelligence of the universe are experienced in a unified way. Viewing things this way, clear resonances can be found with the conclusions of our research, both in the planned date for the Singularity and in its deep meaning, since, as we have proposed in this article, it will be, precisely, at the beginning of the 23rd century —around the year 2217— when energy and consciousness discover their definitive non-duality. In any case, despite these coincidences, in a moment we are going to propose a possible alternative to Kurzweil's idea that *our civilization will expand outwards, until it embraces the entire universe* — which sounds excessively optimistic and adventurous—, suggesting, exactly, the opposite path, that is, that *our civilization will be oriented inward, until reaching the very bowels of matter and consciousness*, thus transcending the world of dualities in its unified foundation —beyond space and time— that is generating, moment after moment, the entire universal manifestation.

After this process of gestation of the idea of technological singularity that has taken place throughout the last century, we currently find ourselves with a very extensive debate on numerous questions that humanity is beginning to ask itself in the face of the

increasingly evident exponential development of technology and the very foreseeable arrival of an explosive moment of artificial intelligence, when it will *be a billion times more powerful than all human intelligence today*: Will that enigmatic moment truly be reached one day? Is this just a purely theoretical and speculative idea? A simple utopian—or dystopian—approach from imaginative science fiction authors and transhumanist enthusiasts? Among those who take this concept seriously, there is a wide variety of opinions about the probability, how and when the singularity will occur. Some view it as an uncertain event, which may or may not occur. Many consider it an inevitable destiny. Others are actively working to prevent the creation of digital intelligence beyond human oversight. When could that expected/feared moment happen? There are futurists who see it as an almost imminent event. Most predict it could happen in the coming decades—between 2030 and 2080—. Others believe that there are still two or three centuries left. Or even more. In the event that the singularity happens, what would be the implications for human beings? There is also controversy on this point. The most optimistic believe that humans and machines will work together and, by integrating biological and technological elements—nanotechnology, biotechnology, neurotechnology, brain-computer interfaces—the development of our organisms will be promoted and our physical, perceptual and intellectual capabilities will increase. There are even those who venture the possibility of achieving cybernetic immortality by “downloading consciousness” (?) into some imperishable artifact. Optimists also believe that, at a collective level, it will be possible to create a planetary environment of abundance—in which all people will have all their needs met—which will bring us closer to achieving a more just, global and integrated society. Faced with this idyllic panorama, the most pessimistic predict, on the contrary, a future full of uncertainties and threats, given the serious dangers posed by the gradual loss of control of our lives in the face of the growing decision-making power of mechanisms with artificial intelligence. Some believe that superintelligent machines, as they become the dominant species on the planet, will devalue human beings until they become obsolete organisms, which, in the long run, may even lead to the extinction of humanity itself. Noting this disparity in criteria, some authors have predicted that we are inevitably heading towards a “*artilect war*”, which will break out before the end of the 21st century, between those who embrace artificial intelligence—“*cosmists*”—and those who reject it—“*terrans*”—. Faced with this apocalyptic panorama, it seems more sensible and cautious to approach the path towards singularity with less sectarian positions, which, while guaranteeing responsible control of the situation and respect for shared ethical values, are capable of actively integrating the extensive potentialities objectives of the technological world with the deep subjective capacities of human consciousness. There are ample reasons to think that this scenario is not only possible, but is the natural outcome of the long history of evolutionary development since its origin. Our research points strongly in this direction. Let's check it out.

### **3. Some key points from our research on the pattern of evolution**

We are going to briefly recall some central ideas that have emerged throughout our research, since, we believe, they can serve to clarify, to a large extent, some of the doubts raised about the moment, the manner and the deep meaning of the singularity towards which we are rapidly heading.

At the outset, let's define the general framework. If we want to achieve a truly integral understanding of the singularity event, it is completely necessary to refer to at least



three different realms within omni-comprehensive Reality: non-dual absolute reality, potential relative reality, and space-time relative reality. [See Addendum 8]. We have outlined these three areas as follows:

—**Non-dual absolute reality:** Given that all manifested reality appears, inexorably, in the form of interdependent dualities —subject/object, inside/out, origin/end—, we can understand them as polar manifestations of a reality that transcends them and is “prior” to that dualization. Physicists speak of infinite potential energy in the original quantum void, and sages speak of infinite diaphanous consciousness in the final mystical void. Our proposal is that these two voids are the same and only absolute Emptiness, perceived by physicists objectively and by contemplatives subjectively, but which, in itself, is neither objective nor subjective, but rather the unity, the identity or the indifference of both facets simultaneously, in clear syntony with the proposals of dual aspect monism, neutral monism and non-dual traditions of wisdom. This realm has been called *dharmakaya* in Buddhism, *nirguna brahman* in Hinduism, *nameless tao* in Taoism, *godhead* in Christian mysticism, *ein sof* in Jewish Kabbalah...

—**Potential relative reality:** Since non-dual Emptiness completely lacks the slightest separation between subject and object, it cannot perceive itself in any way. Therefore, if it wants to contemplate itself, it has no choice but to unfold itself into an original objective pole —basically of energy— and a final subjective pole —basically of consciousness—, fully maintaining its empty essence. Between both poles, a very broad spectrum of balances between both polar facets is instantly generated, which runs the entire range from the most basic states —of enormous energy and little consciousness— to the highest —of little energy and enormous consciousness—. The different levels of this unified, entangled, archetypal and potential energy-consciousness spectrum are, precisely, the “*potential levels of stratified stability*” that will be actualized, one after another, along the successive steps of universal evolution. This realm of reality has been called in very different ways depending on the perspective of its approach: “*unus mundus*” (Carl Jung), “*implicated order*” (David Bohm), “*akashic field*” (Ervin Laszlo), “*morphogenetic field*” (Rupert Sheldrake), “*quantumland*” (Ruth Kastner), “*unified spatial memory network*” (Nassim Haramein), “*semi-harmonic EM background field*” (Dirk Meijer) ...

—**The space-time relative reality:** The entire spectrum of potential energy-consciousness —the universal wave function— is actualized —collapses— at each point-instant of the universal pixelated manifestation, recursively. In other words, the infinite and eternal Here-Now of the potential realm is projected and identified, moment after moment, in and as each finite and fleeting here-now of the manifested realm, to contemplate itself from that determined perspective, and, immediately, return to its potential foundation. We can speak, thus, of a recursive toroidal dynamic, through which the entirety of the ever-present archetypal spectrum is progressively actualized into the world of space-time forms. [See Addendum 6]. In any case, we must not forget that everything happens in a single and full Here-Now that encompasses in itself, in its entirety, all the illusory distances and durations of the dynamic cosmic hologram. [See Addendum 9].

This recursive dynamic between the self-evident and infinite Void —which is, in fact, the only real protagonist in this whole game of appearances— and all its space-time forms is intrinsically creative, and is facilitated by the unified field of memory that, step



by step, it is developing at a fundamental level. All the information collected at any point-instant of the manifested world is immediately introjected into that basic field of collective memory which, in this way, increases, moment by moment, its potential. In this way, any entity, whatever the level of the spectrum in which it operates, has, in the most intimate depth of itself, free access to the entirety of that unified field of information, although, depending on its characteristics specific, connect only with certain facets of that field. Toroidal dynamics has, therefore, a true holographic structure, in the sense that each “part” of itself has information about the “totality”, and is, in fact, a particular reflection of that totality.

This integral, fractal, holographic, toroidal and non-dual dynamic of fundamental energy-consciousness greatly facilitates the understanding of the evolutionary process. Through this recursive dynamic that we are proposing, the ever-present and self-evident Emptiness focuses, moment after moment, on the successive levels of the potential spectrum of energy-consciousness, starting with the most basic ones —primarily energy— and ending in the most elevated —primarily consciousness—. In each plane, it actualizes the specific potential of that level, integrating it with the aspects already emerged at previous heights. At each turn, starting from the resources available in the unified field of memory, it projects itself into each specific situation in space-time, perceives that specific situation based on the possibilities of its structure, and immediately introjects that information into the field of collective memory of the foundation. When a specific entity has deployed the full potential of the fractal stratum in which it basically operates and has integrated it with everything that emerged in the preceding stages, having reached a specific level of complexity, it can resonate with the next fractal level of the energy-consciousness spectrum, and, in this way, ascend to a new step on the long ladder of evolution.

Next, we will present the simple harmonic pattern that, according to our research, precisely marks the rhythm at which the successive potential levels of stratified stability present in an entangled way in the fundamental unified field emerge in the spatiotemporal manifestation.

Previously, we believe that it may be interesting to remember here that the original hypothesis of this research arose as a possible solution to the problem posed in paleontology when it was found that the fossil record did not support Darwin's original idea that new species appeared **gradually** by the impulse of natural selection over time. In recent years it has been seen that the gradualist conception of evolution was only responsible for a small part of the evolutionary changes, and that the most profound modifications in biological evolution occurred at certain moments in the history of the groups, very quickly and giving rise to stable species with very few subsequent variations. Neo-Darwinian theory can explain the mechanisms of microevolution —the small changes within a species— but it encounters great difficulties when it tries to account for the origin of new species and, even more so, when faced with the emergence of genera, families or higher taxonomic divisions. Macroevolution —the evolution of these higher-order taxonomic categories— presents differences between divisions that are too marked to have arisen through gradual transformations. In the words of C. H. Waddington: *“one of the fundamental problems of evolutionary theory is to understand how the very obvious discontinuities that we find between the main taxonomic groups: phylum, family, species, etc. have arisen.”* The Darwinian version of a slow, gradual and continuous process has given way to an interpretation characterized

by sudden, **jumpy** and discontinuous changes, as S. J. Gould and N. Eldredge have shown with their theory of “punctuated equilibria”. [See the section “*The crisis of Darwinism*”].

At the beginning of the twentieth century, physicists encountered a similar problem — albeit in a different area— when they verified how the energy emitted or absorbed by atoms, far from presenting itself as a **continuous** flow according to their predictions, did so in a quantified, **saltatory** way, in very precise packages. For several decades they tried to explain this strange phenomenon by searching for a good mathematical theory of the atom that would generate these quantum numbers in a natural way. The solution came when E. Schrödinger proposed the similarity of the world of electrons with musical harmonics —standing waves—, thus giving rise to the happy “wave function”, a fundamental piece of revolutionary quantum physics of surprising precision. [See the section “*A harmonious solution*”].

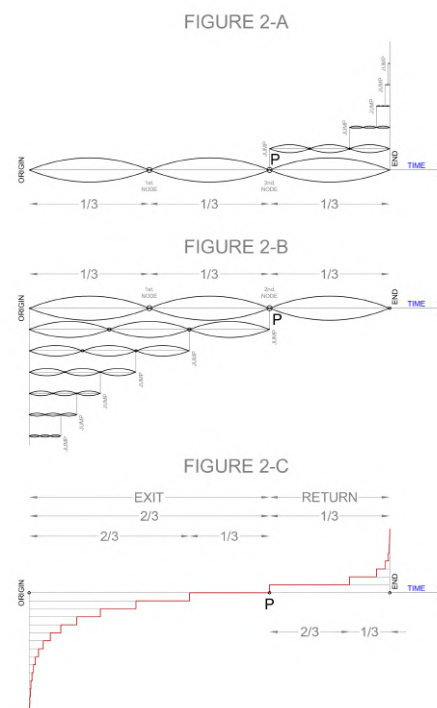
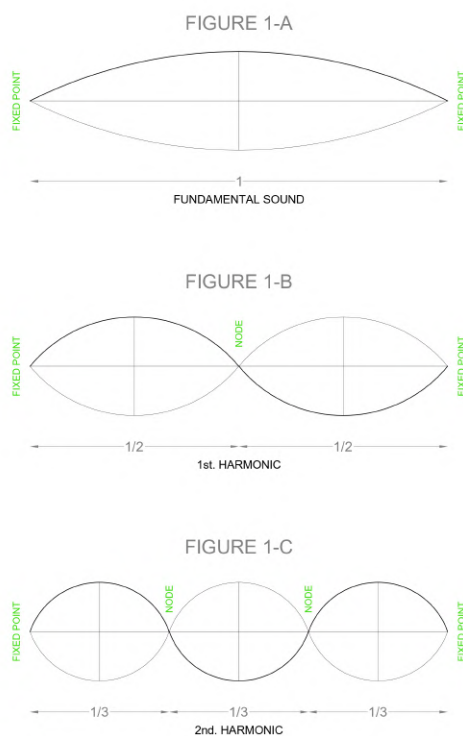
In line with this, we believe that it may be interesting to remember here that while for the Ionian philosophers the fundamental question was finding the corporeal substance of the world, for the Platonists and Pythagoreans the key was in the patterns and orders. Today's science seems to move, basically, in this second line. The fundamental claim of Pythagoreanism was that numbers constitute the immutable principles underlying the world, the essence of reality. Discovering that the proportions between musical harmonics could be expressed simply and accurately, the Pythagoreans considered that the cosmos itself was a harmonic system of numerical ratios: everything real could be expressed by relationships between numbers. According to them, the numerical order inherent to sounds was in direct relationship with the organization of the universe itself, and, thus, they affirmed that music was nothing more than the expression of the internal relations of the cosmos, and that every material manifestation was the result of concert of universal vibrations.

The new science considers the universe holistically, that is, it perceives nature as an integral whole, as a global movement that is not fragmented or divided. We have seen how the evolutionary dynamics of this unified universe unfold its novelties discontinuously, how the most profound transformations of evolution happen abruptly and suddenly, generating a hierarchy of progressively complex and inclusive levels of organization. We find ourselves, then, with a vibrant unit —the evolutionary universe— that channels its energy flows into a very defined series of levels of stability. Like atoms. Like musical instruments. Both in the world of atomic physics and in the field of music, the secret of its sudden jumps and sound discontinuities was revealed through standing waves and musical harmonics. Couldn't the same thing happen in the field of evolution? Isn't it very coherent that this unified universe that we are beginning to discover generates similar creative patterns at its different levels of organization? Isn't the idea, then, very suggestive that the sudden evolutionary leaps that have occurred in the history of the universe respond, precisely, to those same stationary waves that turned out to be the key to the explanation of the subatomic and musical worlds? This has been the basic intuition that has given rise to our hypothesis of evolutionary rhythms that we will outline below. [See the section “*Statement of the hypothesis*”].

Jacob Bronowski, in 1970, proposed a theory about a single process that explained hierarchically ordered diversity without reductionism. This theory proposed, as a general cosmological principle, the concept of “*stratified stability of potential levels*” as

the key to the evolution of non-equilibrium systems. It basically proposed the existence of certain levels of stability around which energy flows would be grouped and organized, thus allowing successive and sudden ascents towards new strata of progressive complexity. Our hypothesis constitutes a very precise specification within this suggestive approach. Let's see it.

Standing waves are known to anyone who has played a musical instrument. The characteristic of these waves is that they divide the vibrating unit —string, tube or ring— into complete equal sections. A guitar string, for example, since it has fixed ends, cannot vibrate in any way, but has to do so in such a way that its ends remain motionless. This is what limits its possible vibrations and introduces integers. The string can vibrate as a whole (see fig. 1-A), or in two parts (see fig. 1-B), or in three (see fig. 1-C), or in four, or in any other number whole of equal parts, but it cannot vibrate, for example, in three and a half or five and a quarter parts. In music theory these successive standing waves are called harmonic sounds. The unlimited series of these harmonics, starting from the “fundamental sound” of the complete original unit, very precisely define the successive notes of the Pythagorean circle (spiral) of fifths, the entire hierarchy of levels of stability of the musical flow.



Taking now, again, the example of a guitar string, let's imagine that it is tuned to the note C —fundamental sound—. If we vibrate half of its length —first harmonic— we will obtain the same original note an octave higher. If we vibrate the third part —**second harmonic**— we will get a **different note**, which in our case will be a G. That is, **with the second harmonic the sound novelty arises**. Taking the new note, in turn, as a fundamental sound, we can repeat the experience as many times as we want, and, thus, we will obtain successive staggered sound novelties with each second harmonic. That is, by vibrating a third of the length a creative jump will appear, and with the third of the third another, and with the third of the third of the third another, etc.

This simple fact gives us the key to our hypothesis. The proposal is that simple: considering the temporal totality as a vibrant unit, the successive chained second harmonics, that is, the successive thirds of the duration, will mark the emergence of evolutionary novelties. Or, put another way, the second harmonics will define those “potential levels of stratified stability” through which the creativity of nature is channeled, that is, those rungs of the evolutionary ladder through which the energy flows in its ascending creative process of progressively complex and conscious organisms.

In figs. 2-A, 2-B and 2-C we can graphically observe the global process. Taking the complete temporal trajectory —from the “origin” to the “end”— as the fundamental sound, we have drawn the successive level jumps in both directions: in fig. 2-B the section that goes from the origin to the second node “P” of externalization —what is called the “exit” or “outward” stretch—, and in fig. 2-A the section that goes from that same second node to the end —the “return” or “inward” stretch—. In fig. 2-C we reflect the joint trajectory, the global ladder of evolution.

A moment ago, when outlining the basic characteristics of **potential relative reality**, we said: *“Since non-dual Emptiness completely lacks the slightest separation between subject and object, it cannot perceive itself in any way. Therefore, if it wants to contemplate itself, it has no choice but to unfold itself into an original objective pole —basically of energy— and a final subjective pole —basically of consciousness—, fully maintaining its empty essence.”* When this apparent dualization of non-dual Emptiness occurs, an illusory distance is generated between both poles —between the initial and final singularity, between the object and the subject, between energy and consciousness— with an endless number of intermediate balances between both facets. When this polarization of the Void takes place, automatically, a bidirectional tension is produced between both extremes in its attempt to recover the original non-duality: an ascending and expansive current coming from the initial “**energy-(consciousness)**” pole and a current descending and contractive coming from the final “**consciousness-(energy)**” pole. Both flows traverse, in opposite directions, the entire spectrum of potential levels of stability —standing waves— in which both polar facets are balanced, in different proportions. Instant after instant, these ascending and descending flows resonate with each other at a given level —standing wave— of the energy-consciousness spectrum, thus “collapsing” the entire potential field into a concrete event of the manifested world. (See Addendum 7). The proposal that we are developing is clearly in tune, obviously, with the syntropic theory of the mathematician Luigi Fantappiè. This theory states that the increase in complexity in the evolutionary process is a consequence of advanced waves that emanate from attractors located in the future and that are directed backward in time. It proposes, therefore, moving from a mechanistic and deterministic model of the universe to a new model, entropic-syntropic, in which the expansive forces (entropy) and the cohesive forces (syntropy) work together, so that the unfolding of phenomena is no longer just a function of the initial conditions, but also depends on a final attractor.

In clear resonance with all this, our approach has, in the same way, a great similarity with the Transactional Interpretation of Quantum Mechanics —proposed by John Cramer and inspired by the “absorber theory” of John Wheeler and Richard Feynman—, which describes quantum interactions in terms of a standing wave formed by interference between retarded waves (forward in time) and advanced waves (backward

in time). We can summarize this transactional model as follows: The emitter produces a retarded “offer” wave, forward in time, which travels toward the absorber, causing the absorber to produce an advanced “confirm” wave, backward in time, which travels back to the emitter. The interaction is repeated cyclically until, finally, the transaction is completed with a "handshake" —a standing wave— sealing a two-way contract between the past and the future, and the actual quantum event occurs, the “collapse of the wave function”. (See fig. 15). The “pseudo-temporal” sequence of this story is, of course, just a semantic convenience to describe a process that is, in truth, instantaneous, since it does not happen in space-time but in the potential underlying unified field that is, as we have said, timeless and non-local.

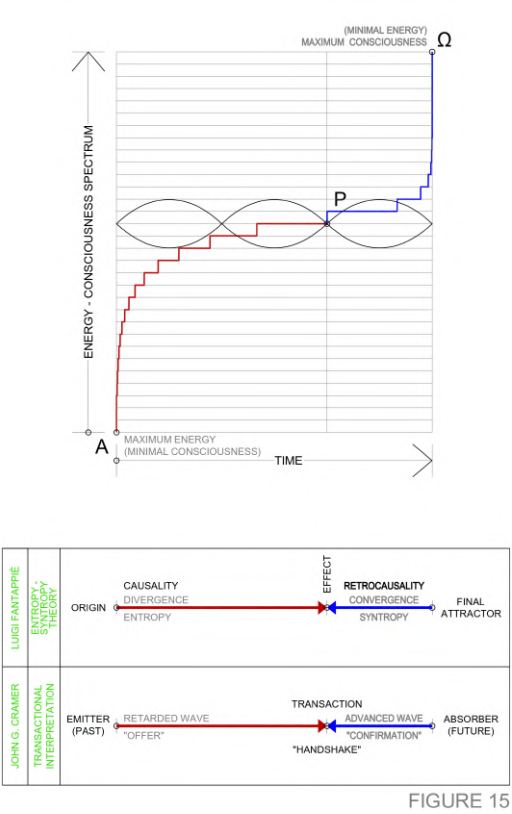


FIGURE 15

We want to highlight here that the “handshake” between the ascending and descending flows can take place at any level of the energy-consciousness spectrum. In fact, at the original moment, the “transaction” occurs at the very base of the spectrum, but, throughout the evolutionary process, the level gradually rises, level after level, as we have explained previously: *“Through this dynamic recursive approach that we are proposing, the ever-present self-evident Emptiness focuses, moment after moment, on the successive levels of the potential spectrum of energy-consciousness, starting with the most basic ones —primarily energy— and ending at the highest levels —primarily consciousness—. In each plane, it actualizes the specific potential of that level, integrating it with the aspects already emerged at previous heights. (...) When a specific entity has unfolded the full potential of the stratum in which it basically develops and has integrated it with everything that has emerged in the preceding stages, once it has reached a specific level of complexity, it can resonate with the next “harmonic” of the energy-consciousness spectrum, and thus ascend to a new rung of the long ladder of evolution.”* Ultimately, the entire evolutionary process is nothing more than the attempt to manifest in a gradually way, level after level, the entire spectrum of energy-consciousness and, simultaneously, embrace it in its entirety, from

one end to the other, to reproduce in the world of space-time appearances the non-duality of its potential foundation.

After having outlined in these last paragraphs the basic mechanisms that, according to our proposal, underlie the evolutionary dynamics, we will now briefly recall the data provided in our research that, as we think, seem to confirm the validity of the harmonic hypothesis. To check if, as we have proposed, the successive standing waves that characterize the chained second harmonics truly define the fundamental stages of the evolutionary ladder, it will be enough to fix a couple of points of that plot and, automatically, the entire spectrum of levels of stability will be outlined that evolution will have to ascend, step by step, until reaching the pole of final singularity. We will take, therefore, as fixed points, the moment of the **Big Bang** —just over 13.5 billion years ago— as the original moment —Singularity A— and the moment of formation of our **solar system** —just over 4.5 billion years ago— as a turning point between the “departure” and “return” sections of the global trajectory. Well, as we say, simply with these two pieces of information, the entire spectrum of evolutionary levels is fully defined. Now, we only have to check whether our theoretical plot adjusts, or not, to the data provided by paleontology, anthropology and history. And what we see is that this “periodic table”, certainly, marks, one after another, each and every one of the stages in which the successive taxonomic grades of the human phylogeny have been unfolded: **Kingdom: animal** (A- 1), **Phylum: chordate** (A-2), **Class: mammal** (A-3), **Order: primate** (A-4), **Superfamily: hominoid** (A-5), **Family: hominid** (A-6) and **Genus: homo** (A-7). And then the same thing happens with all the maturation phases of our primitive ancestors: **Homo habilis** (A-7), **H. erectus** (B-1), **archaic H. sapiens** (B-2), **H. sapiens** — Neanderthal— (B-3) and **H. sapiens sapiens** —Cromagnon— (B-4). And the same thing happens, once again, with the successive transformations experienced by humanity in its most recent history: **Neolithic** (B-5), **Ancient Age** (B-6), **Middle Ages** (B-7), **Modern Age** (C-1) and the emerging **Postmodern Age** (C-2). Full success! [See the section “*Verification of the hypothesis in the macrocosm*”]. If, as we see, all these stages conform to the predictions of the “periodic table” of rhythms that we have proposed, it is more than likely that our hypothesis can also give us the key to glimpse the successive stages that will unfold in the coming years, in a progressively accelerated process, which will ultimately lead to an instant of infinite creativity —the Singularity  $\Omega$  — in a couple of centuries. Let us point out here that, if we group these stages into series of seven elements, the result corresponds exactly to the successive links of the so-called “Great Chain of Being” —Matter, Life, Mind, Intellect and Spirit—, which also coincide, basically, with the evolutionary epochs proposed by Kurzweil —Physics and Chemistry, Biology, Brains, Technology, and Fusion of Technology and Human Intelligence— or with the spheres of Teilhard de Chardin —Cosmosphere, Biosphere, Noosphere, Pneumosphere and Omega Point—.

We invite readers interested in the study of the progressively accelerated unfolding of the basic stages of evolution and history —and their asymptotic final instant— to consult the works of other authors such as, for example, the geologist **André de Cayeux**, the historian **François Meyer**, the electrical engineer **Richard L. Coren**, the paleontologist **Jean Chaline**, the computer scientist **Carter V. Smith**, the mathematician **Paul Hague**, the physicist and futurist **Theodore Modis**, the electrical engineer **Mario Hails**, the systems theorist **Graeme D. Snooks**, inventor **Ray Kurzweil**, astrophysicist **Alexander D. Panov**, social psychologist **Akop P. Nazaretyan**, mathematician and economist **Erhard Glötzl**, physicist and psychologist

**Peter Russell**, philosopher **Terence McKenna**, toxicologist **Carl J. Calleman**, physicist **Börje Ekstig**, futurist **John M. Smart**, economist and systems theorist **Pierre Grou**, astrophysicist **Laurent Nottale**, software engineer **Nick Hoggard**, biologist **Miguel García Casas**, philosopher of history **Leonid Grinin**, anthropologist and sociologist **Andrey Korotayev**, the software engineer **David J. LePoire**... [The summarized proposals of some of these authors can be found in Addendums 1, 2 and 5]. Before moving forward, we would like to make two or three clarifications here about the matter we are investigating. Given that the human being currently constitutes the living organism that, on our planet, has unfolded the greatest number of levels of the “complexity-consciousness” scale, to make our verification about the fundamental stages that have been defining the vanguard of the evolutionary process, we have strictly adhered to the basic stages characteristic of human phylogeny. There is nothing anthropocentrism in this, because, as we are proposing, the same underlying structures of the potential spectrum of energy-consciousness that have manifested themselves on our planet through the concrete forms of our phylogeny, we suspect will have done the same in an endless number of planets of the universe through very different forms, although, in good logic, they will have to be resonant and convergent with ours given that we are all fleeting expressions of the same and only unified field of timeless and non-local collective memory.

Another objection that is often raised when observing the surprising confirmation of our predictions about the accelerated pattern in which the evolutionary stages unfold, consists of suggesting that we have been able to rig the result by taking into consideration only culled data that validates our hypothesis. We believe that, in the case at hand, this objection cannot be raised, given that, far from selecting isolated facts, we have taken complete series of paleontological, anthropological and historical data, as they appear—in block—in any basic general culture manual. There is still a third objection that is often raised on this topic. It states that it is not true that the rhythm of transformations has been accelerating throughout the evolutionary process, but that it is an error of perspective caused by the greater abundance of data on what has happened in more recent times. To refute this objection, it will be enough to remember, for example, that our ancestors of the Lower Paleolithic, generation after generation, were making the same stone tools for more than a million years, while, on the contrary, in just the last century, the transformations that have occurred in all areas of our lives have been spectacular and dizzying. A simple error in perspective?

Returning to the issue of verifying our hypothesis, we will now expand the check field. Previously, we have raised the holographic nature of our universe. An intriguing feature of holograms is that when the holographic plate is broken, each of the resulting fragments contains the entire original image. Each part contains the whole! Up to this point we have seen how the long trajectory of human phylogeny, from the moment of the Big Bang until today, has been unfolding in the manifested universe practically the entire spectrum of energy-consciousness of the potential foundation following the rhythm foreseen in our evolutionary hypothesis. Let us now check whether, in the same way, human ontogenetic development—a significant “part” of the “whole”—also displays that same spectrum of energy-consciousness in accordance with our predictions. This is not a new idea, given that in very different cultures it has already been proposed that the human organism—the microcosm—is a capsule of the whole—the macrocosm—an individual concentration of the world, a unit that reflects, like a mirror, the entire universe. According to this approach, the growth or development of

human beings is a rapid recapitulation and integration of all levels gradually unfolded in the universal evolutionary process, during its long and slow paleontological development. This is, basically, the main contribution of the German naturalist Ernst Haeckel to the theory of evolution in what he called “the fundamental biogenetic law”, with which he defended the parallelism between the development of the individual embryo and the development of the species which belongs: “*ontogenesis, that is, the development of the individual, is a brief and rapid repetition (a recapitulation) of the phylogenesis or evolution of the lineage to which it belongs.*” (See the section “*Regarding phylogenetic-ontogenetic parallelism*”).

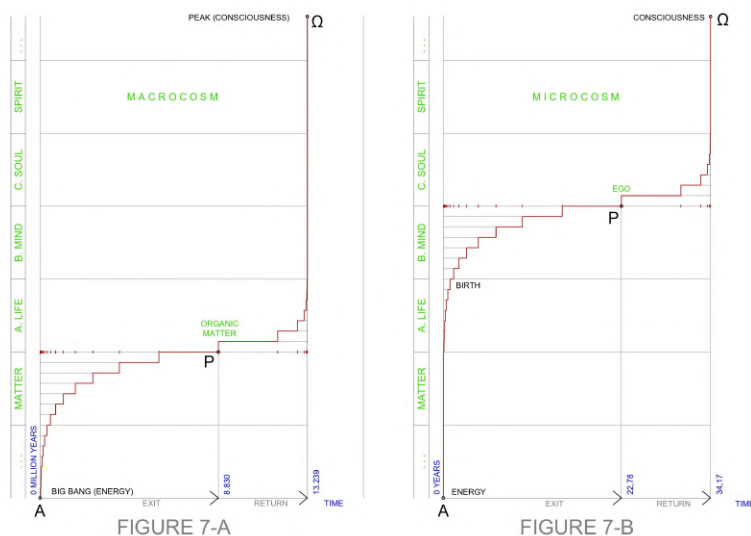
To now verify our harmonic hypothesis in the field of human ontogeny, we will take a couple of reference points —as we did in the case of phylogeny— to establish our theoretical framework of rhythms, in such a way that, automatically, the entire spectrum of levels of stability will be outlined that, according to our predictions, will have to be unfolded, one after another, throughout the complete trajectory of a human life until its full realization. Assuming that the human being is tuned to the same temporal pattern of evolutionary cycles that we have analyzed in the phylogenetic process, and knowing that, according to a famous study by **Richard M. Bucke**, the spontaneous emergence of what he called the “cosmic consciousness” takes place around the age of 34, we are going to take the C-4 cycle, which lasts 34.17 years, as the base cycle to verify our hypothesis in the individual development of a fully realized human organism. Starting from this data, we can take as points of fixation of the plot, the moment of generation as the original pole and the moment of realization of the “cosmic consciousness” —34.17 years— as the final pole. In this way, automatically, our theoretical forecast for the complete trajectory of a human life is already defined, both in terms of the rhythm of emergence of the successive stages to be followed, and the specific content of each of them. That is to say, starting from the moment of engendering, each human existence will have to unfold in a progressively slowed manner the “exit” section —or “outward arc”—, oriented towards the inflection point located around the age of 22 —coinciding with the affirmation of the integral thinker **Ken Wilber** that the process of return, or “inward arc”, does not usually begin before the age of 21— and, from there, the “return” section will begin, now in a progressively accelerated way, towards the final luminous pole. If this proposal is true, our life would reveal itself as a fascinating and magical dance set to the beat of the music of the universe. Or, in other words, we would be nothing less than a radiant condensed expression of the great cosmic symphony. Let's check, now, if our forecasts adjust to the data offered by embryologists, for the intrauterine phase, and developmental psychologists (synthesized in Ken Wilber's integral list in his latest book *The Religion of Tomorrow*), to the postnatal phase.

Summarizing what we have explained in the section “*Verification of the hypothesis in the microcosm*”, we will say that, starting from the single-celled living phase, which in the macrocosm we called A-1, our plot is adjusted, one after another, with all the stages of embryological and psychological development: **Ovogonia, follicular maturation, ovulation, fecundation (A-1), Cell division, nervous cord and notochord formation (A-2), Limbs and amnion formation, reptilian trunk development (A-3), Placental constitution, limbic system development (A-4), Anthropoid fetus resemblance, neocortex development (A-5), Hominid fetus resemblance, birth (A-6), Oceanic consciousness —pleromatic— (A-7), Physical consciousness —uroboric— (B-1), Sensorimotor mind —archaic— (B-2), Imaginal mind —archaic-magical— (B-3), Symbolic mind —magical— (B-4), Conceptual mind —magical-mythical— (B-5),**



**Concrete rule/role mind —mythical— (B-6), Abstract rule/role mind —mythical-rational— (B-7), Formal mind —rational— (C-1), Pluralistic mind —relativistic— (C-2), Lower logical vision —holistic— (C-3), Superior logical vision —integral— (C-4), Para-mind —transglobal— (C-5), Meta-mind —visionary— (C-6) and Overmind —transcendental— or Final Witness (C-7).** The **Supermind**, as we will later see, transcends and includes the entirety of this spectrum of energy-consciousness from its non-dual foundation. Full success!

We invite readers interested in the study of the unfolding of the successive stages of the psychological development of the human being to consult the works of the most renowned researchers in the different areas of the psyche: **Jean Piaget**, **Michael L. Commons** and **Francis A. Richards** (child and adult cognitive development), **Jean Gebser** and **Ken Wilber** (worldview development), **Abraham Maslow** (needs development), **Clare W. Graves** and **Jenny Wade** (values development), **Don E. Beck** and **Chris Cowan** (development of spiral dynamics), **Jane Loevinger** and **Susanne Cook-Greuter** (development of self-identity), **Lawrence Kohlberg** (moral development), **James Fowler** (development of stages of faith), and **Robert Kegan** (development of orders of consciousness). Despite investigating various aspects of human psychology, the coincidence between the stages of development proposed by these different authors is truly resounding, and, in the same way, its correspondence with the evolutionary stages unfolded from the appearance of modern man to the day of today —from our B-4 cycle to C-3— it is also practically total. [See Addendum 4].



Once the verifications on the validity of our hypothesis have been successfully carried out, both in human phylogeny and ontogeny —both in the macrocosm and in the microcosm—, we can now also confirm the parallelism between both processes, as clearly observed in figures 7-A and 7-B. It is enough to see how both start from the same original point (pole A of energy) and arrive at the same final point (pole  $\Omega$  of consciousness), how both unfold the same spectrum of energy-consciousness —as manifested in the great chain of being: matter, life, mind, intellect and spirit— and how the two travel an identical trajectory of unfolding and folding —of exit and return—, guided at all times by the successive chained second harmonics. The only difference between both trajectories lies in the level of the spectrum at which the inflection point between the “outward arc” and the “inward arc” takes place, since in the macrocosm it is located on the border between “matter” and “life” —the appearance of organic

macromolecules after the formation of the Earth—, and in the microcosm it does so on the border between the “mind” and the “intellect” (or “soul”) —the formation of the mature ego—. As we explained above, the “handshake” between ascending (entropic) and descending (syntropic) flows can take place at any level of the energy-consciousness spectrum and, in fact, at the original instant, the “transaction” took place at the very base A of the spectrum and at the final instant it will take place, as we will see, at the summit  $\Omega$ .

As we have just seen, in our research we have taken into account both external aspects (objective forms of energy) and internal aspects (subjective forms of consciousness), both individual aspects (ontogenetic) and collective aspects (phylogenetic). At each stage of the evolutionary path, these four aspects —individual/collective, interior/exterior— have been present, since none of them would have been possible without the simultaneous presence of all the others. This approach fully coincides with the idea expressed synthetically in Ken Wilber's famous “four quadrants” graph, in which the entire evolutionary history is summarized in the four facets —individual, collective, exterior and interior— in a simple way, omni-comprehensive and coherent. In this graph [see Addendum 3], the “individual” facets are located in the upper area, the “collective” ones in the lower one, the “external” ones in the right area and the “internal” ones in the left one. So, the upper left quadrant describes the individual-inner process (the conscious self), the upper right quadrant the individual-outer process (the energetic organism), the lower left quadrant the collective-inner process (the cultural perspective) and the lower right quadrant the collective-external process (the social system). All evolutionary levels unfolded throughout the history of the universe —the entire spectrum of energy-consciousness— are reflected in each of the four quadrants according to their specific facets. This is because each evolutionary leap produces simultaneous transformations in the four areas in a coordinated manner, which gives rise to a specific and recognizable flavor for each historical era. Usually, many researchers not only restrict their field of observation to only one of the quadrants — according to their academic specialty— but also reduce it to a specific facet of it —to a specific line of development— and, in many cases, even they limit it further by focusing exclusively on a certain period of history. In this way, in the end, it is practically impossible to perceive the correspondences, similarities and “the patterns that connect” the enormous plurality of the data. It seems clear, then, that a comprehensive approach to evolutionary dynamics is much more appropriate, not only to demarcate and precisely define each and every one of the steps taken throughout the process and the transition phases between them, but to perceive the complete shape of the resulting staircase.

Let's look at some examples of the series of stages proposed by various researchers from different lines of development, in each of the quadrants, from the appearance of *homo sapiens sapiens* to the present day. We can observe the enormous syntony with all the stages of our hypothesis, all six of them, from B-4 to C-2.

We start with the lower-right quadrant, which encompasses all collective-external processes, that is, successive **social transformations**. Development of **social organizations** [according to **E. Laszlo**]: ...nomadic tribes (B-4), neolithic villages (B-5), ancient empires and city-states (B-6), feudal kingdoms (B-7), national states (C-1), supranational units (C-2)... Development of **socio-economic systems** [according to **E. Laszlo**]: ...hunter-gatherer societies (B-4), agropastoral (B-5), agricultural (B-6), artisanal/preindustrial (B-7), industrial (C-1), postindustrial (C-2)... **Technological**

**development** [according to **A. de Cayeux**]: ...Acheulean lithic industry —technical mode 2— (B -2), Mousterian —technical mode 3— (B-3), Aurignacian —technical mode 4— (B-4), polished stone/mesolithic —technical mode 5— (B-5), age of metals —bronze-iron— (B-6), machine age (C-1), atomic age (C-2)... Development of **modes of production** [according to **K. Marx**]: ...savagery (B-4), barbarism (B- 5), slavery (B-6), feudalism (B-7), capitalism (C-1), socialism (C-2)...

We are going to continue with the lower-left quadrant, which encompasses all the collective-inner processes, that is, the successive **cultural transformations**. Development of **worldviews** [according to **J. Gebser / K. Wilber**]: ...archaic (B-3), magical (B-4), magical-mythical (B-5), mythical (B-6), mythical- rational (B-7), rational (C-1), pluralistic (C-2), integral (C-3)... Development of **value systems** [according to **C. Graves**]: ...magical-animistic (B-5), egocentric (B-6), absolutist (B-7), multiple (C-1), relativist (C-2), systemic (C-3)... Development of the “meme-values” of **Spiral Dynamics** [according to **D. Beck and C. Cowan**]: ...survival —beige— (B-4), kin spirit —purple— (B-5), power gods —red— (B-6), truth force —blue — (B-7), strive drive —orange— (C-1), human bond —green— (C-2), flex flow —yellow— (C-3)...

Let us now continue with the upper-left quadrant, which encompasses all individual-inner processes, that is, the successive **psychological transformations**. **Cognitive** development [according to **J. Piaget / M. Commons / F. Richards**]: ...sensorimotor (B-4), symbolic preoperational (B-5), conceptual preoperational (B-6), concrete operational —rule/role mind— ( B-7), formal operational —rational mind— (C-1), pluralistic mind —meta-systemic— (C-2), inferior logical vision —paradigmatic— (C-3)... Development of the **self-identity** [according to **J. Loevinger / S. Cook-Greuter**]: ... symbiotic (B-4), impulsive (B-5), self-protective (B-6), conformist (B-7), conscientious (C-1), individualistic (C-2 ), autonomous (C-3)... **Moral** development [according to **L. Kohlberg**]: ...premoral (B-4), obedience and punishment (B-5), individualism (B-6), interpersonal agreement (B-7), law and order (C-1), social contract (C-2), universal ethics (C-3)... Development of **orders of consciousness** [according to **R. Kegan**]: ...0 - incorporative (B-4), 1st - impulsive (B-5), 2nd - imperial (B-6), 3rd - interpersonal (B-7), 4th institutional (C-1), 4, 5 (C-2), 5th - interindividual (C-3)... Development of **spiritual intelligence** [according to **J. Fowler**]: ...undifferentiated (B-4), magical (B-5), mythical-literal (B-6), conventional (B-7), reflective-individual (C-1), conjunctiva (C-2), universalizing community (C-3)...

The transformations in the upper-right quadrant, which encompasses all individual-external processes, were very noticeable during all the stages of phase A —Life— and in the first stages of phase B —Mind—, but, since the appearance of anatomically modern man —Homo sapiens sapiens— transformations have basically taken place only in the structure and functioning of our brains —through the increase in the complexity of synaptic connectivity— but without major apparent changes. Therefore, in this quadrant we will take as references the series of stages of development of the **organisms** in our phylogeny proposed by various researchers of the temporal phase that spans from the origin of life on our planet to the appearance of homo sapiens. (Also here we can see the enormous syntony of these lists with the stages of our hypothesis, from A-1 to B-3). (Remember Addenda 1, 2 and 5). Let's see, to begin with, the 14 stages of development throughout our phylogeny proposed by **J. Chaline, L. Nottale** and **P. Grou** —observe the practical total coincidence of these 14 evolutionary leaps in

the fractal tree of life, with the 14 nodes of our series A—: Node 1: Emergence of life - first prokaryotic cells / Node 2: First eukaryotic cells (A-1), Node 1: Multicellularity / Node 2: Exoskeletons (A-2), Node 1: Tetrapodia - first lung tetrapod / Node 2: Homeothermy - first mammal (A-3), Node 1: Viviparity - first marsupials and placentals / Node 2: First primate - prosimian (A-4), Node 1: First anthropoid ancestor - ape / Node 2: Proconsul - great apes (A-5), Node 1: Common ancestor P/G/H / Node 2: Australopithecus (A-6), Node 1: ... / Node 2: First Homo (A-7)... Let us see, below, the stages of the evolution of the biosphere after the emergence of life on Earth according to **A. Panov**: prokaryotes / eukaryotes (A-1), vertebrates (A-2), reptiles (A-3), mammals (A-4), hominoids (A-5), hominids (A-6), Homo habilis (A-7), Homo erectus (B-1), archaic Homo sapiens (B-2), Homo sapiens — Neanderthal— (B-3) Homo sapiens sapiens —Cromagnon— (B-4)... Let us see, next, the proposal of **T. Modis** for this same phase that we are studying: ...origin of life (A-1), first life multicellular/Cambrian explosion (A-2), first mammals (A-3), first primates (A-4), first orangutan (A-5), first hominids (A-6), first stone tools (A-7), development of speech (B-1), development of fire (B-2), development of “modern humans” (B-3)... For his part, **D. LePoire** describes the different evolutionary stages from the origin of the life, defined by successive changes in energy flows: ...complex cells (A-1), Cambrian (A-2), mammals (A-3), primates (A-4), hominids (A-6), humans (A-7), language (B-1), fire (B-2), eco-adaptation (B-3), modern humans (B-4)...

After verifying the solidity of our hypothesis through this general overview —interior and exterior, individual and collective—, we believe that the rungs of the evolutionary ladder are quite well located, outlined and defined. Next, we are going to try to understand the mechanisms that generate the transitions —the level jumps— between the successive steps. Let us remember that, according to our hypothesis, each level of the evolutionary spectrum is defined by a specific standing wave —with a characteristic fundamental sound— and that the sound novelty arises with the emergence of the second harmonic —in the third third of the original wave— that defines the new level of the spectrum. Each evolutionary stage consists, therefore, of three sections of equal duration: the one that extends from the original fixed point to the first node, the interval between the two nodes and the section that goes from the second node to the final fixed point. The global process is as follows: in the environment of the original pole, an evolutionary novelty emerges incipiently and slowly tests its capabilities on the way to the first node, at which time a first concrete sketch of the characteristic paradigm of this stage appears, and, from there, its full potential is progressively deployed in the section towards the second node. It is at that moment, just when the stage reaches its full maturity, when it begins to show its intrinsic limitations and, simultaneously, an emerging evolutionary novelty begins to dispute its hegemony. This situation is, precisely, the origin of a new stage, in which, throughout the first section, the previous paradigm enters into decline, while the emerging paradigm begins its deployment, thus repeating the previous process. For those interested in the new sciences of evolution, we will say that these second nodes of each cycle correspond to the moments of “bifurcation” (Mitchell Feigenbaum), of “creative imbalance” (Ilya Prigogine), of “beneficial catastrophes” (René Thom), in which level jumps occur. At these points the “attractors” that define the previous pattern disappear, and those that define the new state appear, “fallen from the sky”. The fundamental sound suddenly changes to its second harmonic.

The scheme we have just proposed clearly resembles the classic model of successive logistic curves —nested S-shaped curves— that is frequently used to represent the processes of growth, learning, development or propagation of almost any natural or induced phenomenon by the man. Simply put, when something begins to grow or spread, it first starts very slowly, then accelerates until it reaches a maximum, after which the rate of growth or diffusion slows until it basically tends to zero. Within the studies carried out on the topic at hand, the proposals developed by **T. Modis** or **D. LePoire** are based, precisely, on this model of logistic curves. Similarly, **R. Kurzweil** states that a specific paradigm generates exponential growth until its potential is exhausted. When this happens, he says, a paradigm shift occurs, allowing exponential growth to continue. He thus summarizes the life cycle of a paradigm in three stages: 1. Slow growth, 2. Rapid growth, and 3. Stabilization as the particular paradigm matures.

Starting from our syntony with this idea, a specific characteristic of our hypothesis consists of the proposal that each of the successive evolutionary stages —each of the first-order S-curves— lasts one third of the previous one, so that the global resultant of the complete series of these successive S-curves ends up giving rise to a second-order exponential J-curve, which becomes asymptotic upon reaching the final singularity pole.

In the last paragraphs we have located and defined, from the outside perspective, each of the steps of the evolutionary ladder and the transition zones between them. Next, we are going to describe that same process from the inside perspective. To do this, at the outset, let us remember the basic outline of our hypothesis. We started from the idea that the non-dual Emptiness —self-evident but invisible—, in order to contemplate itself in and as the manifested world, needed to polarize itself —at least apparently— as object and subject, in the form of an original pole of energy and a final pole of consciousness, which, from the first moment, gave rise to a very wide spectrum of balances between both facets. We also said that this fundamental polarization automatically generated a bidirectional tension between both extremes: an ascending, expansive and entropic current coming from the initial “**energy-(consciousness)**” pole and a descending, contractive and syntropic current coming from the final “**consciousness-(energy)**” pole. Instant after instant, these ascending and descending flows resonate with each other at a given level —standing wave— of the energy-consciousness spectrum, thus “collapsing” the entire potential field of information into a concrete event of the manifested world. This “handshake” between the ascending and descending flows —we explained— can take place at any level of the energy-consciousness spectrum. In fact, at the original moment, the “transaction” occurs at the very base of that spectrum, but, throughout the evolutionary process, the level gradually rises, level after level, until reaching the final moment in which the resonance between both flows takes place at the top of the spectrum.

If we describe the evolutionary process from the inner perspective, we can state that, given that at the original moment the consciousness aspect was fully absorbed by the energy aspect, the entire journey since then has been nothing more than a progressive distancing from that situation of enclosure and darkness, and, consequently, a gradual increase in clarity and lucidity. In summary, during the early stages of development of **matter**, the consciousness facet is absorbed into the energy facet. With the emergence of **life**, the facet of consciousness takes a leap back, separates itself from mere matter, perceives it and, thus, can act on it. With the emergence of the human **mind**, the facet of

consciousness once again jumps inward, self-consciousness appears, which separates itself from simple subconscious life and thus increases the capacity for action on the natural world. With the emergence of the rational **intellect**, the facet of consciousness jumps back, once again, allowing us to think about thinking and, in this way, understanding of how things work increases exponentially and, therefore, the ability to intervene on them. This entire process is possible due to the presence, from the very original moment, of pure consciousness —the “**Witness**” that Hindu tradition speaks of— as the final pole of the process. It is worth clarifying, therefore, that this final pole of pure consciousness does not evolve at all —since it remains full and immutable at all times— but its reflection and identification with the different entities and organisms that develop throughout the process —atoms, molecules, cells, multicellular organisms, vertebrates, mammals, primates, apes, humans...— it does evolve in terms of its capacity to actualize that full consciousness, which allows it to progressively increase the ability of organisms to capture, store, process and respond to information from the environment.

The Hungarian essayist **Arthur Koestler** in his book *The Ghost in the Machine* used the term *holon* to designate any system that was a whole in itself and, at the same time, a part of a greater whole. Pursuant to this terminology, a hierarchy of holons is called a holarchy. According to our approach, two antagonistic holarchies occur simultaneously in the evolutionary universe. A decreasing and entropic holarchy of energies, in which the maximum capacity is found in the original pole A, and a growing and syntropic holarchy of consciousnesses, in which the maximum capacity is found in the final pole  $\Omega$ . The integral thinker **Ken Wilber**, starting from the idea that the Kosmos is composed of holons, has studied evolution as a holoarchic process —in the growing sense— in which each of the successive emerging holons transcends and includes its predecessors, so that, as the number of levels included increases, step by step, its depth—that is, its consciousness— and its complexity also progressively increases. Wilber has carefully analyzed the transition phases between successive levels of the spectrum, given the importance of these moments for a healthy unfolding of the process. Starting from the initial identification of consciousness with the characteristic structure of a given level, each evolutionary leap will basically consist of a process of initial transcendence and subsequent inclusion —of denial and conservation, of differentiation and integration— with the consequent dangers of fixation or addiction in the transcendence phase and of avoidance or allergy in the inclusion phase. In essence, it is about unfolding the basic potential of each and every one of the successive structures of the evolutionary holarchy, avoiding exclusive identification with any of them and embracing the entire spectrum already covered, until finally reaching the pure Witness —the essence of consciousness of each and every one of the different levels of development— which transcends and includes the entire process.

#### 4. An integral approach to singularity

After having briefly presented some significant aspects of our research on the pattern of evolution from an integral perspective, we believe we are in a position to be able to provide some answers to the major doubts that are beginning to arise in light of the vertiginous acceleration of technological development and the consequent prediction that in the coming decades an asymptotic point will be reached —a technological singularity— at which *artificial intelligence will be a billion times more powerful than*

*all human intelligence*, radically transforming current civilization and our own understanding of existence.

**—Will the Technological Singularity really occur? Will that enigmatic moment ever be reached? Is this just a simple utopian —or dystopian— approach by imaginative science fiction authors and transhumanist enthusiasts?**

According to our research, yes, everything seems to indicate that, truly, the evolutionary process is rapidly heading towards a moment of Singularity in the very near future. We have a very different opinion when it comes to describing this summit event, simply, as “technological”, because, from our point of view, many other elements will be at play in this event, as we will soon explain, some of which are enormously more significant. This is not just a mere quantitative question related to the computing capacity of some technological devices, no matter how great it may be, because what we are talking about is, nothing less, that the next Singularity  $\Omega$  is, essentially, the antagonistic pole of Singularity A, that is, of the Big Bang itself. And, let us remember, all the universal dynamics arose, precisely, from that original polarization of the fundamental Emptiness as A and  $\Omega$ , object and subject, energy and consciousness. As Alan Watts said: “*Current will not begin to flow from the positive end of a wire until the negative terminal has been established.*” That is, the universe of forms would not have emerged from the Void through the original Singularity A, if the final Singularity  $\Omega$  had not been present, simultaneously, from the beginning of time.

According to our hypothesis, the key to the creative leaps unfolded throughout evolution and history is in the standing waves that are generated, at the same original moment, from the fundamental sound. As we have seen, the cause of these standing waves is that the ends of the vibrating unit are fixed and, therefore, limit the possibilities of oscillation, thus generating the entire quantum spectrum of musical harmonics. It is worth remembering that these harmonics are the potential archetypes that, one after another, are actualized in and as the successive stages of evolution and history. The key to the entire evolutionary process lies, therefore, in these original and final poles. The universe would not have emerged without the simultaneous presence of the singularities A and  $\Omega$ , exit and entrance to the full and self-evident Void. If the original pole consisted, basically, of an *explosion* in the realm of “energy,” the final pole toward which we are rapidly heading will fundamentally consist of an *implosion* in the realm of “consciousness.” But, let's look closely, both facets —“energy” and “consciousness”— are not two different realities, but rather polar aspects of the same and only Void, the objective and subjective facets of the ever-present Self-Evidence. Therefore, from our perspective, the “trick” of evolution and history will be definitively revealed in this next final moment. At that moment, it will become evident that the entire trajectory traveled from Singularity A —Big Bang— to Singularity  $\Omega$  is occurring in the eternal Now that, in truth, we are. In this way, we will understand that our life has not been a mere fleeting fragment in the middle of an endless process, but, in fact, we have always been that pure and timeless Self-evidence in which all worlds have happened, are happening and will happen. There has been no “before.” There will be no “after”. There is only Now. And Now. And Now...

**—When could the expected/feared moment of the Singularity truly take place? Could it happen during the life cycle of the current generation?**

Among those who seriously investigate the idea of the Singularity in its technological meaning, there is a wide variety of opinions about when it will happen. There are some who see it as an almost imminent event, most place it between the years 2030 and 2080, and there are others who believe that there are still two or three centuries, or even more, before the human era comes to an end. As we have said, the Singularity, as it appears in our research, is not reduced to a mere technological issue. So, the moment at which artificial intelligence reaches a certain computing capacity does not truly define the Singularity in the cosmological sense that we are proposing. Kurzweil himself, who places the technological Singularity in 2045, states that from that year on our civilization will expand outwards and we will be able to saturate the universe with our intelligence before the end of the 22nd century. Many futurists —although not all— make their predictions about the moment of the Singularity by observing the pace of progress only from a technological point of view and, exclusively, over the last century. If the framework of the study is expanded, encompassing other perspectives and analyzing longer periods, things are perceived more clearly...

In our research we have verified how the gradual acceleration of the rhythm of the transformations that we perceive in all areas of our environment, far from being a specific and exclusive phenomenon of recent years, has, in fact, been the permanent norm throughout the entire evolutionary process from the very origin of life. The intervals between the successive creative leaps that have marked the entire unfolding of our phylogeny have been shortening, again and again, at a very precise rhythm. In short: all the great news has emerged with the successive second harmonics. The vanguard of the evolutionary wave has been jumping levels, again and again, as it reaches the last third of each stage. Beyond earthquakes, eruptions, meteorites, glaciations, mass extinctions, plagues, floods, world wars, pandemics... Whether we investigate the interior or exterior, individual or collective facets, we always find the same pattern in the emergence of the novelties. In all quadrants, at all levels, in all lines of development... The full coherence revealed between this plurality of approaches allows us to outline with sufficient precision the location and content of each and every one of the stages of the evolutionary spectrum, as well as its emergency and sunset phases. If this has happened throughout the entire process from the beginning, there is no reason to think that it will stop doing so in times to come. According to our scheme, we are currently going through stage C-2 —which covers from year 1909 to 2114—. Stage C-3 will take place between 2114 and 2183. C-4 will take place between 2183 and 2205. C-5 between 2205 and 2213. C-6 between 2213 and 2215. C-7 between 2215 and 2216. If our calculations are correct, in the following year, in 2217, the  $\Omega$  Singularity will occur. It will not just be a technological event, but an integral one —interior and exterior, individual and collective— as we are going to propose in a moment.

**—What happens when machines reach or surpass human intelligence? Can we conceive of a conscious machine? Could a machine become self-aware?**

On many occasions, in the world of artificial intelligence there is talk of the possibility of consciousness in robots or of achieving cybernetic immortality by downloading human consciousness into some everlasting artifact. From the non-dual perspective in which we are framing our research, these approaches seem quite naïve. To clarify this point of view, we will now recall some of the central aspects of our proposal that raise great doubts about these naïve expectations.



The only absolute reality of everything and everyone is the same and unique non-dual Void, in which the objective and subjective facets are completely undifferentiated. In other words, the Void is, at the same time, subject and object, that is, invisible but absolutely self-evident. To contemplate itself in some way, that self-evident Emptiness polarizes itself as object and subject, that is, as potential energy and pure consciousness. All **objects** in the universe, ultimately, are constituted exclusively by that **potential energy**, actualized to varying degrees along a very broad spectrum of levels. In the same way, all **subjects** in the universe, ultimately, are constituted exclusively by that **pure consciousness**, actualized in varying degrees along a very broad spectrum of levels. The entirety of this unified spectrum of potential energy-consciousness, which in itself is timeless and spaceless, collapses, moment after moment, in each point-instant of the space-time universe, illusorily identifying itself with an endless number of finite and fleeting forms from the that contemplates itself in infinite ways, thus originating a creative toroidal game of projections and introjections, which progressively manifests in the holographic universe the infinite potentiality of its Void foundation.

With all this we want to say that consciousness, far from being a product of neuronal interconnections or of technological sophistication, is, in truth, the foundation of all of this. Just as all objects in the universe are but finite forms of the same primordial potential energy, all subjects in the universe are but fleeting identifications of the same primordial pure consciousness —the transpersonal Witness of which Hindu tradition speaks—. As we have seen, the progressive actualization of the unified potential field of fundamental energy-consciousness in space-time takes place through the resonance between the upward and entropic flow from the originating pole of energy and the downward and syntropic flow from the final pole of consciousness, which collapses into a certain standing wave of the spectrum. Starting from the lowest level —of great energy and little consciousness—, the successive collapses of the potential unified field in each point-instant of the space-time universe gradually scale the different levels of the energy-consciousness spectrum, unfolding, in this way, in the world of forms the entire range of stages of our phylogeny, which, one after another, when integrated with those that have previously emerged, give rise to progressively more and more complex and conscious organisms. For example, the human being, at the current moment, integrates in himself all the characteristics —interior and exterior— of the harmonics corresponding to elementary particles, atoms, molecules, cells, chordates, mammals, primates, hominoids, hominids, *Homo habilis*, *H. erectus*, archaic *H. sapiens*, *H. sapiens*, *H. sapiens sapiens*, neolithic humans, to those of the ancient age, of the middle ages, of the modern age and of the postmodern age. That is to say, at this precise moment we are recapitulating, in its entirety and simultaneously, the entirety of universal history. It would be enough to eliminate any of those steps —e.g. the molecular one— for the entire rest of the staircase above that level to automatically collapse. So, inevitably, we can only actualize the highest levels of the energy-consciousness spectrum if, previously, we have unfolded in an integrated way the totality of the lower levels, since it is, precisely, the complete presence of the entire evolutionary ladder from the base which allows the interaction between the ascending and descending flows of potential energy-consciousness to resonate with each other, when the time comes, at the highest levels of the spectrum.

Starting from these ideas, if our approach is correct, the answer to the question we have asked —can we conceive of a conscious machine?— is immediate: NO. Robots, or any other mechanical device activated by artificial intelligence algorithms, can simulate

behaviors similar to those of human logical thinking, but without the slightest hint of consciousness. As with a book or a television, they can give us ideas or emotions that they themselves completely lack. All these tools, no matter how sophisticated they appear, are, essentially, mere material objects, with the consciousness of the most basic levels of the evolutionary spectrum. Their structures lack practically all the rungs of the long evolutionary ladder —whose entire presence, as we have seen, is absolutely necessary for the emergence of the highest levels of the energy-consciousness spectrum— and, therefore, they operate in the almost total unconsciousness.

**—What are the implications of the Singularity? What is its deep meaning? What is really at stake in this summit event of evolution and history?**

The usual answer to this question refers to an exclusively technological version of the singularity, according to which —it is said— within a few decades, artificial intelligence will far surpass human intelligence, thus producing a turning point and no return, from which machines will be able to build better versions of themselves at such a rapid and exponential rhythm that humans will no longer be able to understand or control them. Within this approach, some believe that superintelligent machines, as they become the dominant species on the planet, will devalue human beings until they become obsolete organisms, which, in the long run, could even lead to extinction itself of humanity. Our proposal points completely in another direction. We do not understand singularity in a merely technological sense, but rather we approach the topic from an integral and cosmological perspective. According to the global framework that we are proposing, the original singularity  $A$  consisted, basically, of an *explosion of energy*, and, in a complementary way, the final singularity  $\Omega$  will be, basically, an *implosion of consciousness*. Let's see, below, how this can happen.

The future panorama that, today, is usually proposed by the majority, from a purely technological perspective, revolves around the idea that our postbiological heirs, after the singularity, will embark on the conquest of outer space, until finally, they manage to convert all the silly matter and energy in the universe into enormously intelligent matter and energy. Along these lines, the Russian astrophysicist Nikolai Kardashev proposed, in 1964, a scale to measure the degree of technological evolution of a civilization —and the degree of colonization of space— with three categories: a Type I civilization achieves mastery of resources from its home planet, a Type II dominates the resources of its planetary system, and a Type III dominates the resources of its galaxy. Later, other authors have added two other categories on this scale: a Type IV civilization harnesses the energy of a galactic supercluster, or even the entire visible universe, and a Type V civilization harnesses the energy of multiple universes. All this sounds quite adventurous and speculative, because if, in truth, the conquest of outer space is the usual destiny of the most developed civilizations that populate the universe —presumably many of them more advanced than ours— how is it that we do not have news from any of them? This is, in essence, the paradox raised in 1950 by the Italian physicist Enrico Fermi that, later, has had important implications in the projects to search for signals from extraterrestrial civilizations (SETI). In summary, “the Fermi paradox” highlights the apparent contradiction between the estimates that affirm that there is a high probability that other intelligent civilizations exist in the observable universe and, on the other hand, the complete absence of evidence of said civilizations.

Perhaps the solution to the Fermi paradox does not consist in assuming that our knowledge or our observations are defective or incomplete, but, rather, in understanding that the path followed by the most developed civilizations, far from heading towards the conquest of outer space, directs its steps exactly in the opposite direction, that is, towards the conquest of inner space. This is precisely the approach carried out by the futurist and prospective consultant **John M. Smart** in his works *The Transcension Hypothesis* and *Evo Devo Universe?* Integrating insights from theoretical physics, information and computing theories, and evolutionary developmental biology (evo-devo), Smart develops a framework that seeks to reconcile the evolutionary and unpredictable characteristics of universal emergence (evo) with universal trends development and potentially statistically predictable (devo), particularly those central to accelerating change—which clearly resonates with our entropic-syntropic proposal—. He says: *“One apparent trend is an ever-increasing spatial and temporal locality of universal complexity development. Another is the apparent hierarchical emergence of increasingly space, time, energy, and matter (STEM) dense and efficient substrates for adaptation and computation. Another is the increasing complexity, interiority, empathy, ethics, and integration of mind. The latter trend has been discussed most notably in the noosphere hypothesis, and its prediction of the increasing interconnectedness, integration, ethics, and consciousness in complex minds.”* The *transcension hypothesis*—or *developmental singularity hypothesis*—proposes that a universal process of evolutionary development guides all sufficiently advanced civilizations toward what might be called “inner space”, a computationally optimal domain of scales of space, time, energy and matter increasingly dense, productive, miniaturized and efficient, and, finally, towards a black hole-like fate. If the transcension hypothesis is correct, inner space, not outer space, is the final frontier of universal intelligence. The closer we get to engineering on the Planck scale, the greater the densities and efficiencies of our designed objects. One of the most curious processes of our universe is that it seems to be hierarchically constructing special zones of intelligence that are increasingly compressed, localized and restricted in space, more accelerated in time and with greater densities in energy flows (ergs/sec/gr) and matter. As the special physics of our universe appears to support computing and physical transformation at increasingly denser, more miniaturized levels, and at more efficient scales in STEM, the current acceleration of our civilization toward a black hole-like limit seems likely to continue, which would be the most favorable place in which universal intelligence could achieve the greatest understanding and consciousness. Surprisingly, if current trends continue, a physical limit to computational acceleration should arrive within a few centuries.

Until now, as each particular computing system has become saturated in its capabilities, new ones with increasing miniaturization, power flux density, and efficiency have continually emerged. Recently, I received an email from computer scientist Jason K. Resch in which he states: *“I have been gathering research for a planned article on the limits of technology and where it is going. During that research I projected that based on current technology trends, within approximately two centuries we will reach the fundamental physical limits of the best possible technology. Basically it is following Kurzweil's law of accelerating returns (a generalization of Moore's Law) until we reach Bremermann's limit a limit on computational speed imposed by known laws of physics. Currently we're off from that limit by a factor of about  $10^{34}$ . Or  $2^{112}$ . So it will take another 112 doublings of current computer speed to get there. Over the past century the trend has been fairly consistent of computing technology doubling roughly every 18 - 24 months, so that puts us between 173 and 224 years away from that point.”*

STEM density and computational/metabolism efficiency are growing exponentially, or more rapidly, at the forefront of universal intelligence development. Just as gravity alters space-time around high-mass objects, STEM compression can cause increasing curvature of space-time in the most complex environments and, in the limit, lead to the formation of something similar to a black hole. Black holes, truly, can be a development destination and a standard attractor for all higher intelligence. They can even not only be ideal attractors of advanced complexity, but also act as true “seeds” within a hypothetical chain of successive universes. In this scenario, each universal civilization, as it transitions toward black hole-like intelligence, may be in the process of becoming something analogous to a seed or a spore, that is, a developmental structure that packages its evolutionary history and experience in such a way that it transcends our seemingly finite and potentially dying universe —just as seeds transcend dying biological bodies— waiting for the right conditions to replicate it. In the transcension hypothesis, a potential evolutionary role in the reproduction of the universe is assigned to all cultural intelligences that successfully develop in the cosmos. In this sense, it is proposed that the local intelligence of the Earth is on the way to forming a reproductive system analogous to a black hole for the formation of seeds capable of originating a new universe within a recursive multiverse. According to this hypothesis, if local intelligence on our planet continues to develop successfully, it will leave our visible cosmos very soon in universal time.

This transcension hypothesis proposed by John Smart, although based almost exclusively on merely “objective” sciences —theoretical physics, theories of information and computation, and evolutionary developmental biology— we believe that it has suggestive resonances with the conclusions of our comprehensive research. Next, we will try to highlight them.

We have said that the original singularity A consisted, basically, of an *explosion of energy*, and that, in a complementary way, the final singularity  $\Omega$  will basically consist of an *implosion of consciousness*. This idea is nothing more than the logical conclusion of our entropic-syntropic approach: since —as we said— in the original instant the “handshake” between the ascending and descending flows of energy-consciousness took place at the very base of the spectrum, in which the *consciousness* facet was fully absorbed in the *energy* facet, once the entire evolutionary process had been completed, in which the level of resonance between both flows has been progressively ascending level after level, upon reaching the final moment of the path, the “transaction” between the flows will take place at the very peak of the spectrum, in which the *energy* facet will be fully absorbed into the *consciousness* facet.

According to our approach —let us remember— in the evolutionary universe, two antagonistic holarchies occur simultaneously. A decreasing and entropic holarchy of energies, in which the maximum capacity is found in the original pole A, and a growing and syntropic holarchy of consciousnesses, in which the maximum capacity is found in the final pole  $\Omega$ . Describing the global trajectory from the “inner” perspective, we have spoken of a holarchic process of consciousness that, starting from its absorption or identification in the original moment with the “external” facet of energy, progressively makes leaps towards “inward”, generating successive emerging holons of greater depth, breadth and lucidity, which, one after another, transcend and include all their predecessors. In essence, it is about unfolding the basic potential of each and every one of the successive structures of the nested evolutionary holarchy, avoiding exclusive

identification with any of them and embracing the entire spectrum already covered, until finally reaching the pure Witness —the essence of consciousness of each and every one of the different levels of development— that transcends and includes the entire process. This holarchic process of consciousness has been described in detail by some authors —such as Sri Aurobindo or Ken Wilber— who have investigated, both experientially and theoretically, the final stages of this path of deepening the inner space. Starting from the pluralistic Mind —relativistic— (C-2), whose structure is currently being unfolded at the forefront of psychological development, the next stages to be followed in the near future will be —using the terminology proposed by Wilber—, the lower logical Vision —holistic— (C-3), the higher logical Vision —integral— (C-4), the Para-mind —transglobal— (C-5), the Meta-mind —visionary— (C-6) and the Over-mind —transcendental— or final Witness (C-7). One of the central characteristics of these last stages of the path is the progressive felt, direct and immediate understanding —not only theoretical— that the world is not exclusively physical, but psychophysical, that is, that the knowing subject and the known object are like the two poles of a magnet, the two ends of a single underlying global field. Upon reaching the highest level of the spectrum of energy-consciousness in the space-time manifested universe —that is, the final pole  $\Omega$ , the Overmind, the pure observing Self— one has the sensation of being a cordial and loving Witness (subject) that embraces the entirety of the evolutionary Kosmos (object) —from the Big Bang to the final moment— without being identified with any particular aspect of that immense Image of All-That-Is, that emerges in your resplendent field of consciousness. In Wilber's words: *“It is this consciousness and this almost omniscient knowledge that turns the overmind into the last great data processor, the loving knowledge machine that it ultimately is. The state usually associated with the overmind is the causal/Witness (True Self or I Am), which usually rests in pure silence, which is simply dedicated to observing, without judgment, comment or any attribution, the emergence of the world. (...) The overmind is I Am plus all the structures that go back to the Big Bang, continuously processing information from any level of existence throughout the entire path of ascent until reaching its own.”* As long as we believe we are a knowing subject alien to known objects, we will continue to move in the world of duality, but, although the unimplicated Witness —the Overmind— is not an exception, it is certainly found in a privileged position, on the very threshold of non-dual reality. The Witness can be interpreted, therefore, simultaneously, as the highest level of the development process, or as the last obstacle that prevents us from discovering our true nature. [We invite readers interested in this point to look at the section *The last Witness* of my work *Non-dual evolution*, whose link can be found at the head of this blog.]

The *center of gravity of the sense of identity* of the different evolutionary organisms has been moving —deepening—, stratum after stratum, throughout the entire great holarchy of the universe, in an endless game of successive identifications-and-disidentifications with everyone and everything each of the levels of the energy-consciousness spectrum, from the original pole A to the final pole  $\Omega$ . At this point, when we find ourselves in the position of the Witness, in the perspective of the ultimate subject who contemplates the entire world of objects as an alien reality, at any moment we can be suddenly swept away by the potential unified field of energy-consciousness, which—as we know—is beyond space and time or, rather, is its true non-spatial and timeless foundation. In that realm, we completely transcend all distinctions between subject and object, and instantly discover the definitive truth: there is not, and never has been, a true witness nor attested world, but only a diaphanous, joyful and unified reality that, moment after moment, it manifests itself before itself in infinite ways. We understand, thus,

experientially, that our true identity is “prior” to all that dual manifestation that unfolds between the poles of creative energy and pure consciousness, extreme reflections of the unique and ineffable Self. We no longer perceive ourselves, therefore, as mere marginalized spectators contemplating an alien universe, but we discover, without the slightest shadow of a doubt, that our real identity is, in truth, the entire spectacle contemplated.

This realm, which we are calling “potential relative reality” or “unified field of timeless, spaceless energy-consciousness”, is what both Aurobindo and Wilber know as the Supermind, the intermediate reality between the primordial Unity —our “absolute non-dual Emptiness”— and the Manifestation —our “relative space-time reality”—, the essential unity between the object and the subject, between knowledge, the knower and the known, which knows all things in the most intimate way imaginable, since not only are they in the consciousness of the one who knows them, but are nothing other than modes of the knower himself. In the words of Aurobindo: “*the supramental Spirit knows all things in itself and as itself*”. According to this Indian philosopher, the knowledge of the Supermind is a total knowledge that has a triple vision: *transcendental*, *universal* and *individual*, which means that each *individual reality* is known in its particularity, but always put in relation to the *universal reality* of the which is part, and, in turn, the set of interdependent realities that forms the concrete totality of the manifestation is apprehended and valued as a symbol and expression of the *transcendent Reality*. In the same way, the Supermind simultaneously possesses the vision of the three times: past, present and future. This capacity enjoys not only that extended horizontal vision, but also its character of self-manifestation and symbolic expression of essential Eternity. Time in its unfolding is thus shown, in a similar way to how Plato proposed it in *Timaeus*, as “*the moving image of Eternity*”.

According to Wilber, the Supermind is the union of the entire manifest Kosmos with your completely empty I Am. Transcending and including all the levels of form that have thus far appeared, it is a full and complete wholeness, a genuine Unity, a truly non-dual Unity, a Unity between Emptiness and the entire world of form. There is no sensation of a subject seeing objects, but there is simply an immense open space inside whose interior phenomena emerge, moment after moment, with no one to look, no one to observe and no one to see. Things as they are, emerge and release, suspended from Suchness and internally resonating with each and every structure it encounters. The Supermind therefore takes into account and embraces every individual thing and event in the Kosmos, known and unknown. The only reality there is is the ultimate simplicity of an open, clear and pure space indistinguishable from everything that emerges in it as its resplendent clarity and whose very interiority is felt and radiates as something infinite and open absolutely to everything.

Let us briefly recapitulate what we have stated in these last paragraphs. After the long *process of internalization* in consciousness, throughout the successive levels of the nested holarchy of evolutionary development, the subjective facet of the process reaches the pole of final pure consciousness —the Witness, the Overmind or the *Singularity  $\Omega$* —, from which *it embraces the entirety of the evolutionary Kosmos* —from the Big Bang to the final moment— without being identified with any particular aspect of that *immense Image (information) of All-That-Is* that emerges in its resplendent field of consciousness. When the subjective facet reaches this point, to the position of the final Witness, *it implodes* in the potential unified field of energy-consciousness, thus

*transcending the universal manifestation in its spaceless and timeless foundation, into which it introjects all the information coming from any level of existence processed along the entire path of ascent from the Big Bang to the Witness. This information introjected into the potential unified field will be the seed that will give rise to a new stage in the recursive multiverse, through which non-dual Emptiness tries to contemplate, in an endless number of subject-object perspectives, its eternally invisible face.*

Doesn't all this sound quite similar to John Smart's transcension hypothesis, according to which *inner space* —in the physical sense—, not outer space, is the final frontier of universal intelligence? Let us remember the *hierarchical emergence of progressively denser, more productive, miniaturized and efficient space, time, energy and matter (STEM) substrates* for adaptation and computing —increasingly closer to the Planck scale—, *which are oriented towards an intelligence similar to a black hole, in the process of becoming something analogous to a seed*, that is, to a developmental structure *that packages all its evolutionary history and experience* in such a way that *it transcends our space-time universe, waiting for the right conditions to be met to replicate* it within a hypothetical chain of successive universes.

We believe that the resonance between our proposal and the transcension hypothesis is quite evident. Both stories seem to describe the same process from two different perspectives —subjective and objective— that complement and enrich each other. According to the scheme of the four quadrants —which encompasses, as we have said, both interior and exterior perspectives, both individual and collective—, this multiple approach is, precisely, the appropriate way to investigate any aspect of the universe if we want to understand it in all its integrity, since any transformation in any of the quadrants imperatively requires the simultaneous presence of correlative transformations in all the others. All four are mutually implicated by each other, because, in fact, all of them are nothing more than the coordinated expression of a unified reality that underlies and transcends them. (Remember Jung's theory of synchronicity). With all this we want to say that the emergence, precisely now, of objective computational substrates increasingly closer to the Planck scale is not a coincidence, at this moment in history in which the subjective facet of consciousness is approaching its peak of the spectrum —to the Witness— in which it will embrace the totality of the information coming from any level of existence processed along the entire path of ascent from the bowels of the Big Bang until that final moment. As Bernard Enginger (Satprem) explains in his book *Sri Aurobindo or the Adventure of Consciousness: The supreme opposition awakens to the supreme identity (...) the upper degree of the supermind is not "above", but here below and in everything (...) the extreme limit of the past touches the bottom of the future that conceived it (...) everything ends in the perfect circle (...) the supramental is the same vibration that endlessly composes and recomposes matter and worlds (...) it is necessary to enter in the last finite to find the last infinite...*

**—How can humanity face the process of approaching the peak moment of the Singularity? How can we prepare for his advent?**

If the proposal we are developing points in the right direction, the path towards the Singularity would affect all facets —organic, psychological, cultural and social— of our lives. From the outset, it is worth making it very clear that the human species, far from

being condemned to complete obsolescence due to the unstoppable emergence of technological artifacts driven by artificial intelligence, will be the key piece that will allow to unfold, individually and collectively, all the potential capabilities of human beings of the stages of development that still need to be covered until reaching the summit in the Singularity  $\Omega$ . At the same time, it is important to note that, although human beings play the fundamental role in this exciting stage of evolution and history, there is not —nor has there ever been— the slightest trace of a truly separate individuality that could take credit of this "feat", for the simple reason that each and every one of the alleged independent selves that we believe ourselves to be are, in truth, nothing more than finite reflections —fleeting identifications— of the same and only final pure consciousness, which constitutes, together with the potential energy of the origin, the fundamental polarity of the universal manifestation. As Erwin Schrödinger said: *"Consciousness is a singular of which the plural is unknown"*.

The integral perspective, from which we are approaching this work, greatly clarifies some basic aspects that must be taken into account in order to healthily access the final Singularity. As a general principle, it is important not to forget that each and every one of the steps of the evolutionary process are manifested in the four quadrants, since there are no interiors without exteriors —nor vice versa—, nor are there individuals without collectivities —nor vice versa—. The singularity, therefore, will inevitably happen in these four areas simultaneously. Each of them needs all the others for their own existence. It is not possible, therefore, to propose an exclusively technological singularity by eliminating, for example, human beings from the equation. The technological facet, obviously, will play a key role in the integral journey towards the Singularity, but not as the exclusive protagonist of the process, but as a very important tool to facilitate the unfolding of the intrinsic potential of the successive steps in the four quadrants and in each one of the specific lines of development within each of these quadrants. Another basic lesson that the integral scheme provides refers to the importance of each and every one of the rungs of the evolutionary ladder as fundamental pieces for its harmonious unfolding. Exclusive absorption in any of them produces a distortion of the overall view. Let us remember, for example, the mythical-heroic model of the Ancient Age, the absolutist-conformist model of the Middle Ages, the rational-empirical model of the Modern Age or the relativist-pluralist model of the incipient Postmodern Age. Each of these paradigms has been an important and valuable step in the development of individuals and human collectivities, but none of them has been able to see beyond their limited point of view. Just look at the complete intransigence and mutual incomprehension between, say, an urban gang member, an Islamic radical, a neoliberal capitalist, and an environmental activist. Each one, passionately defending his own narrow relative truth, appears incapable of appreciating and integrating the valuable contributions of the other points of view. The perspective will begin to change with the emergence of the next holistic (C-3), integral (C-4), transglobal (C-5), etc. levels. The successive envelopes of the holarchy of inner development, which will transcend and integrate all the previous ones, will gradually unfold greater levels of lucidity, depth and consciousness and, at the same time, more integral, loving and ethical perspectives, which will allow them to deal with the situations of increasing complexity that will arise in this final stretch of history.

When the center of gravity of the sense of identity of human beings is located in those higher strata of the energy-consciousness spectrum, we will understand in an experiential way —not just theoretically— that we are not —nor have we ever been—



true separate individualities in a foreign world, but mere multiple reflections of the same and only pure consciousness. That is, we will perceive that others are nothing but diverse expressions of myself, and that everything else is nothing but the objective facet of common subjectivity. This radical understanding will automatically eliminate the ego-centered behaviors characteristic of previous levels, which will facilitate the healthy transition along the last stretches towards the Singularity. But, in the meantime, those stages of greater lucidity and inclusivity arrive, to prepare the way, we can make some suggestions about the role that new technologies can play in the deployment of the four quadrants.

In the upper-right quadrant —which refers to the external aspects of individuals— biological and technological research is already being carried out to integrate organic and inorganic materials with a view to expanding our physical, perceptual and intellectual capacities. Let us think, for example, of bionic engineering, gene therapy, nanomedicine, bio-printing of organs, virtual and augmented reality...

In the lower-right quadrant —which refers to the external aspects of communities— a very promising panorama is also presented regarding the great possibilities offered by new technologies with a view to facilitating a real approach towards a global and integrated society, as well as to facilitate universal access to food, healthcare, housing, education and free time for all of humanity. Let's think, for example, about robotics, artificial intelligence, nanotechnology...

In the lower left quadrant —which refers to the internal aspects of communities— the new information and communication technologies have already begun to facilitate connectivity between human beings on a planetary level —let us remember Marshall McLuhan's *global village* or the *noosphere* by Teilhard de Chardin—, which can foster collective consciousness, the unfolding of shared emerging values and truly cosmocentric worldviews, in line with the integral and non-dual proposal that we are developing in these pages.

In the upper left quadrant —which refers to the internal aspects of individuals— new technologies can also facilitate psychological growth toward integral and transpersonal stages of consciousness and toward motivations of increasing freedom and plenitude. In fact, in the field of spirituality, intelligent machines have already begun to be created capable of generating specific brain wave patterns in human beings —in the upper right quadrant —, correlative to certain meditative and contemplative states of consciousness —in the upper left quadrant— of which the great traditions of wisdom tell us. Perhaps in the near future AI researchers will also be able to create machines that contribute to the development of all the great consciousness structures of the evolutionary spectrum —not just the meditative states— that are absolutely necessary for access to the final Singularity. As Ken Wilber says: “*Bordering on science fiction, we will see things such as the injection into the human brain of billions of nanotransmitters connected to the cloud, forming a neocortex enhanced by intelligent machines and receiving specific instructions from it to accelerate the development of structures and states. We will live in a true heaven on earth for almost any human being, because their brains will be able to connect to a development accelerator that causes complete enlightenment in them.*”

At the moment in which the Singularity is achieved, human beings, individually and collectively, will discover, experientially, that the true Identity of everyone and

everything is —and has always been— the same and only pure Consciousness, the aspect subjective fundamental polarity. At that moment, from the level that we have called the Overmind —or the Witness—, all the information coming from any level of existence processed along the path of ascent from the bowels of the Big Bang until that final moment will be fully embraced and will be immediately introjected into the potential unified field of underlying energy-consciousness —in the Supermind— thus completely transcending the universal space-time manifestation. That Supramental Reality, eternally located in an omni-comprehensive Here-Now, is —and has always been—, simultaneously, the only subject and object of all the virtual and fleeting worlds through which it has unfolded, unfolds and will progressively unfold, instant after instant, the infinite potentiality of the self-evident fundamental Emptiness, in its inexhaustible attempt to contemplate its invisible face in and as the world of forms. Because, as stated in the Heart Sutra: “*Emptiness is form, form is Emptiness.*” Now. Now. Now...

(Note: The English version of this Addendum 10 is made using Google translate)

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