

THE EXTRA-CELLULAR MATRIX

or "Heine Matrix", according to a quantum-energy point of view

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ABSTRACT

Pischinger in the seventies questioned Virchow's theory according to which the cell represents the first living form able to organize itself in multicellular tissues, attributing this merit to the interstitial (extra-cellular) matrix: *"Transit section between the capillary system and the parenchymal cells, connected with the autonomic nervous, hormonal and lymphatic system, consisting of a matrix in which the various substances are dissolved and in which the various cells and terminations are immersed"* (**Pischinger**).

Heine, 2003, deepened this theory to the point of considering the matrix *"the first example of a living organ capable of interconnecting all the others, including the psychic and psycho-emotional sphere"*.

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1. INTRODUCTION

One of the two certainties of our lives is that one day we will die; the other certainty is that in anticipation of this we must live by occupying "a place in space." How we occupy this place is often uncertain and nebulous, as life does not provide us with directions or signs, as in a road route; we must be the ones to orient ourselves hoping to take the right path.

To do this, however, reason alone, an immense but particularly insidious gift, at least in some cases, is not enough. We also need to turn to that intrinsic energy that the human soul (and not only, in my opinion) possesses: emotion, sensation, spirituality or, in a word, universal energy, an infinite network of information, memories, interactions and mysteries, exemplifications of the deep meaning of our existence.

In this respect, quantum physics, once stripped of its probabilistic garb, and observed under its three fundamental axioms¹, I think is the closest reality to the movement and intimate essence of life, even in its chemical and materialistic expression.

The connection between quantum reality with the interstitial matrix that flows between the cells of a complex organism like ours is, for me, very close.

In the matrix, a variegated and multifaceted superfluid, swim biological fragments capable of exchanging primarily energetic information with cells and all other biological formations. Particularly informational proteins that possess a tertiary structure (three-dimensional, thus geometric and toroidal in appearance) that is random but, at the same time, stable, thus able to function as IN-OUT switches according to the needs of the moment.

A superfluid, in my opinion, very close to the true nature of the Universe.

¹ Tunnel effect, entanglement and superposition principle

2. HOW THE EXTRA-CELLULAR MATRIX IS MADE

The extracellular matrix is also called mesenchyme and derives from the mesoblast (one of the three embryonic layers that are formed during fetal development).

The mesenchyme is rich in cells that belong to the reticulo-endothelial system: histiocytes, macrophages, fibroblasts, Kupffer cells (in the liver), glial cells (central nervous system), stem cells. There are also arterial and venous capillaries, nerve endings, biologically active molecules and solutes (cytokines, hormones, drugs, ions, ionized salts, toxins, dissolved gases ...), lymphatic vessels, chemicals and products of cellular metabolism.

Considering it mechanistically only as a filler is therefore contrary to common sense: it makes more sense to think of it as a "living lake" in which organs, tissues, cells and molecules swim.

A lake including lanes able to control the flow of swimmers so as not to create unnecessary and anti-energetic crowds; the lanes are formed by structural proteins (proteoglycans, glycosaminoglycans, structural proteins similar to tubulin and intra-cellular cytoskeleton, elastin, collagen).

This network gives a 'consistency' to the matrix and also the ability to bind the basic energy constituents of biological life: carbohydrates (glucose and galactose), proteins (amino acids and functional proteins), lipids (fatty acids) and water.

All this richness is coupled with the balanced distribution of saprophytic and symbiont microorganisms (the Microbiome) which gives the extra-cellular matrix the peculiar ability to intervene in all the multiple actions-functions of a living multicellular organism: metabolism, oxidoreductive action, acid-base homeostasis and osmotic-oncotic pressure between the inside of the living cell and the outside (the matrix, in fact):

"the cell cannot be conceived apart from the vital environment that surrounds it, the extracellular matrix (Heine)",

"... significant effect on the determination of the genetic expressiveness of the cell itself. And the interaction of genetics with the environment that it determines what we are. Extracellular intoxications can act on the DNA and the matrix can give resonances up to the psychic and emotional level (Heine) ",

" before the cell becomes ill the interstitial fluid becomes ill "(Pischinger).

3. THE PROTEINS OF THE EXTRA-CELLULAR MATRIX

It is currently possible to say how proteins are formed.

It is less easy to say how they manage to assume that characteristic three-dimensional shape on which several of its functions depend.

Predicting how they are composed in a quaternary structure so as to give rise to wonderfully

complex molecules that allow organized life, such as hemoglobin and chlorophyll, I would say is currently very difficult.

Let's go by order:

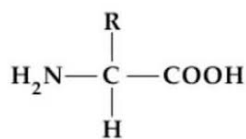
Proteins are assembled in the Ribosome, a material made up of RNA (called rRNA) and protein chains that is produced in the nucleolus (a part of the cell's nucleus). The rRNA consists of a large and a small subunit, respectively 60s and 40s in size ("s" stands for sedimentation coefficient in Svedberg units),

In the Ribosome the amino acids (the building blocks of proteins) are therefore transported thanks to a second type of RNA, the tRNA (transporter RNA). It has a four-leaf clover shape with the two carbon 3' and 5' ends paired. The amino acid is bound on the 3' ends,

The choice of amino acids is guided by the mRNA, or messenger RNA, which is produced as a "template" starting from a segment of one of the two DNA strands.

Nothing difficult so far: the final result is a linear filament, called polypeptide, which is released into the cytoplasm where it twists and folds, taking on a secondary and tertiary three-dimensional structure, necessary to give it the programmed functionality in the mRNA. The difficulty lies in understanding in which intelligent order the right amino acids are chosen, in the right sequence and with the right spatial angles of the bonds so as not to interfere with the steric properties of the amino acid side chains.

The amino acids of the human body (20 are needed, 8 of which are essential²) have an equal basic structure, as in the following drawing:



Diversity is given to them by the presence of a side chain called R (which can also be a simple hydrogen); we note the presence of the two reactive groups -COOH and -NH₂, responsible for the bond between one amino acid and the other (peptide bond), which releases a molecule of water³.

The steric⁴ conformation of the R chain influences the formation of folds, which occur every 3 amino acid residues thanks to the formation of numerous hydrogen bonds that are formed within the polypeptide chain.

² "Essential" refers to those amino acids that cannot be produced by the body, but must necessarily be introduced through the diet

³ It would be interesting to be able to calculate the angle of the oxygen atom with respect to the bond symmetry axis to see if it approaches the golden angle.

⁴ Steric in chemistry: relating to the spatial distribution of atoms, from which steric hindrance, steric isomeric (same structure formula but different spatial configuration)

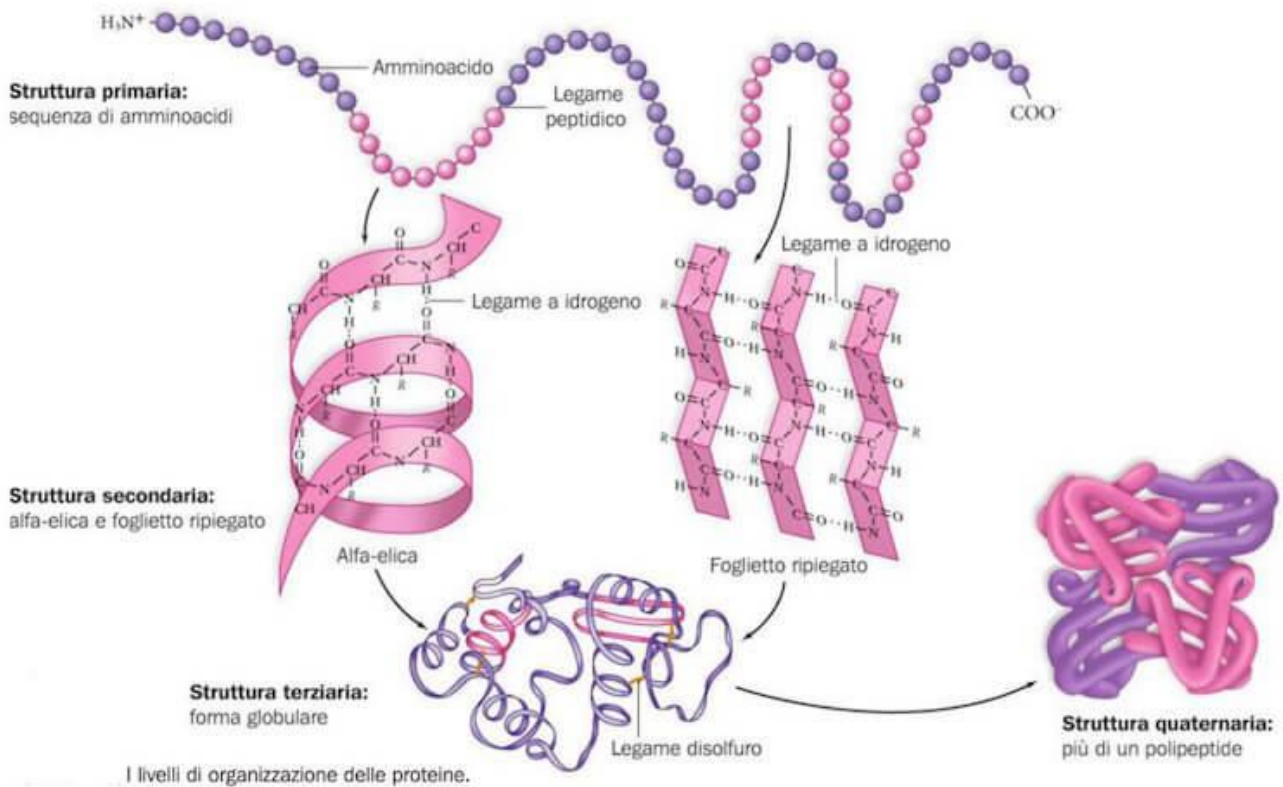


Figure 1 - Image downloaded from the website *chimica-online.it*, the secondary and tertiary structure of proteins. The alpha conformation is of the helicoidal type, and is by far the most frequent, while the beta conformation consists of a simple folding on planes at different angles that can be formed between parallel polypeptide chains (parallel beta sheet: same terminal orientation 3' - 3' and 5' - 5'), antiparallel (antiparallel beta sheet: opposite orientation of the 3' - 5' terminal) or only in a single polypeptide chain which, folding back on itself, forms parallel and antiparallel sections.

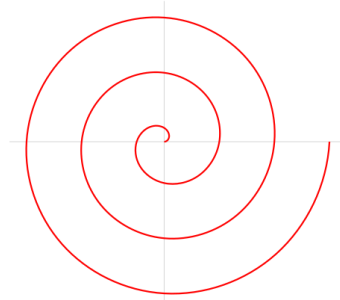


Figure 2 - Image downloaded from Wikipedia (secondary structure of proteins: alpha helix conformation); the shape of the spiral, more right-handed (but also left-handed) imagined three-dimensionally, makes me think of a Fibonacci progression

From these few secondary configurations (alpha and beta, essentially due to the position of a proline every 3 amino acid residues, preceded and followed by a simple residue, such as, for example, a glycine, to prevent an excessive steric encumbrance of the side chains R) derive many tertiary structures, always created by numerous hydrogen bonds capable of making the protein assume many spatial conformations (three-dimensional or sheet spirals, globular with a high

statistical number of steric conformations).

From the point of view of molecular biochemistry this "three-dimensional classification" is burdened by a load of complex experimental data, which must be delegated to artificial intelligence if we want to propose sufficiently "real but not exhaustive " three-dimensional images!

In a nutshell:

"how that complex of information, written in the mRNA, is transformed into a protein that assumes the right three or four steric structures for *the function in that moment* that serves the organism, in the current state of things, in my opinion, it is not known⁵"

4. THE MATRIX AS AN ENERGY SYSTEM

This extraordinary possibility of three-dimensional combination that proteins have, however, cannot be entirely left to chance.

"God doesn't play dice!" Einstein said.

There is a concrete hypothesis that they would be formed by resonating on an electromagnetic grid that would oscillate in a frequency range (according to Ludwig) between 0.1 Hz and 2 Mhz. In nature there are waves, discovered mainly in the 1950s, which have proven to resonate with some of "our proteins", such as *Schumann waves* (electromagnetic resonance that is created between the earth's surface, conductor of electricity, and the ionosphere), whose frequency which oscillates around 7.8 Hz resonates with the hippocampus of the human brain (connected to primary and instinctive behaviors: orientation, attention, sleep-wake rhythm, etc.).

Several other studies, carried out inside a Faraday cage, have shown the existence of Chinese acupuncture channels, understood as electromagnetic impulses (later called solitons) that would propagate inside certain helicoidal proteins, with a similar shape to that of DNA. The impulses would reach the brain obeying all three quantum properties (tunnel effect, entangled effect, superposition principle), with a good chance of predicting their effects. These helicoidal proteins would be part of the reticular structures of the matrix and would be similar to those that make up the cytoskeleton of cells as well as to the tubulins that interconnect neurons.

5. THE MATRIX IS AN OPEN SYSTEM

In this "energetic" vision of the matrix, where the "internal-external" energy exchange is crucial, it remains sensible to think of something that escapes the classical mechanistic laws.

The matrix, in fact, like the whole living tissue, could behave as an "open system", see: **Frolich**, 1983-1986, living systems are coherent and open systems; **I. Prigogine**, 1982: Dissipative structures, self-

⁵ I would come up with one consideration as an independent researcher: what would the spike be and how does it make?

organization of thermodynamic systems in non-equilibrium), that is, capable of producing energy and simultaneously use the entropy produced, with a final balance equal to zero (total energy produced, total consumed without final expenditure: chaos from order, order from chaos).

Thus, the depressing and catastrophic prediction of the second law of thermodynamics, according to which the Universe, seen in its mechanistic becoming, was destined to one day exhaust all its energy, is brilliantly refuted by living matter itself.

This new point of view therefore opens up new questions about the functioning of life and, in general, of the entire Universe, despite the blinders of a certain science in the hands of Neo-Darwinist technocrats who have largely transformed universities into a kind of "priesthood", at the service of an anti-Galilean economic scientism that "in the end, by dint of trying, finds what it seeks"⁶

6. THE MATRIX AS A RESONANCE SYSTEM

An open system capable of using entropy cannot fail to be the object of interest also for what I call "bio-physics of energy", based on the concept of bio-resonance and coherence. In particular, **G. Preparata** (2005), theorized a beautiful but decisive interpretation of how resonance is at the basis of the functions of life and the Universe, explaining the mystery of the passage of state of water in the three states (solid, liquid and gaseous: until now the object of mere description by chemistry, as a function of time and temperature): a sort of "organ that tunes" on oscillations in resonance between its hydrogen bonds.

The extra-cellular matrix, therefore, in its homeostatic function with minimum energy consumption, is well aligned with this "open and resonant" vision, which has its roots in the energetic fabric of the Universe.

A sort of humus in continuous chaotic activity which, conforming to a certain "order", allows the condensation of life as an open and resonant memory, temporally defined.

The chaos accorded to certain sounds that, together, form a score:

"In an open system capable of exchanging energy and matter with the environment (as is, for example, that of a living multicellular organism), the various interacting forces do not do so according to a linear pattern, but are inter-connected in a continuous exchange of energy and matter, i.e., information carried by micro-intensity energies. Each component of the system is in continuous and constant regulatory interaction (both excitatory and inhibitory) with the other parts. Through this continuous biochemical-humoral and biophysical information exchange, the system tends to maintain itself in a dynamic equilibrium involving minimal energy expenditure: homeostasis.

Dysfunction, therefore, will not affect the single part of the system, in the case of the human body the organ, but, through consecutive causal chains, multiple organs and apparatuses that perhaps

⁶ Fortunately, not all of the Official University and Research environment is like this, otherwise we would be not only blind but also incapable of confrontation and growth.

do not reveal, on the surface, a close connection. Pathologies and, before that, functional disorders will be able to be read as the result of information exchanges between cells and thus between organs.

The exchange of information takes place through electromagnetic micro-oscillations, and the mesenchyme, or interstitial matrix, is the medium through which all bio humoral and bioelectronic information is propagated and transmitted to the entire organism.

The matrix thus represents an important intercellular and inter-organic communicative network (Heine)"

From a biological point of view in my opinion this is a vision closer to the reality of life rather than that of a hypothetical Boson (don't hold it against me, Higgs) who, "slowing down" the Newtonian motion of the particles, allows them to be randomly coupled, triggering a relationship of causality that is only linear (**Aristotle, Descartes**).

7. EXTRA-CELLULAR MATRIX AND MATRIX MATHEMATICS BY HEIM

Burkhard Heim (1977), would have theorized a mathematical matrix capable of unifying Einstein's relativity and quantum physics.

The Heim matrix develops through polyvalent logical concepts (and not Aristotle's bivalents YES-NO) and through data based on experience, which are:

- 1) The first law of thermodynamics (conservation of energy, impulse and charge in closed systems)
- 2) The second law of thermodynamics (the existence of entropy or tendency to 'chaos')
- 3) The quantum measure of Planck time (action), energy and mass, not mentioned by Einstein in his theory of relativity
- 4) The existence of macroscopic fields such as:
 - Newton's gravitational field (not mentioned by Heisenberg in his "quantum physics")
 - Maxwell's law of induction (about the existence of electromagnetic waves and photon

X11	X12	X13	X14	X15	X16	X17	X18
X21	X22	X23	X24	X25	X26	X27	X28
X31	X32	X33	X34	X35	X36	X37	X38
X41	X42	X43	X44	X45	X46	X47	X48
X51	X52	X53	X54	X55	X56	X57	X58
X61	X62	X63	X64	X65	X66	X67	X68
X71	X72	X73	X74	X75	X76	X77	X78
X81	X82	X83	X84	X85	X86	X87	X88

Matrice T

Figure 3 - Heim's matrix: a system of 64 non-linear tensor equations arranged in a matrix

By solving these equations, according to Heim, we would be able to prove the existence of other dimensions besides the known ones of the traditional relativistic space-time.

The diagonal of the matrix would open up a kind of 8-dimensional hyperspace (X11 to X88).

The first three dimensions (X11, X22, X33) would be respectively the length, the width and the height (space), while the fourth (X44) is the time.

Both space and time would be quantized (in accordance with Planck's quantum theory⁷), as well as the dimensions identified by the other equations, even if the entire system of 64 equations of the matrix cannot yet be solved.

The equations from X11 to X66 would define both matter and energy, while the other remaining ones, physically empty and therefore impossible to define, would perhaps represent (according to Heim) the "spiritual dimension" of existence. If we remove these last equations from the matrix (there are 28), the system of the others can be solved:

- 1) Space: equations from X11 to X33,
- 2) Time: equations X44,
- 3) Realization potential, equations X55: DNA; the wheat germ (which contains in itself all the information to become wheat),
- 4) Realization (thanks to time the structure is realized in various stages: sprout, flower, seed):

⁷ quantum of Length: $2.48 \times 10^{-66} \text{cm}^2$; Matron (quantum of surface area): $6.15 \times 10^{-66} \text{cm}^2$; Planck elementary time (quantum of time): $5.39121 \times 10^{-44} \text{s}$, the time a photon takes to travel a distance equal to the Planck length, at the speed of light ; Planck's constant (h , quantum of energy): $6.62618 \cdot 10^{-34} \text{J}\cdot\text{s}$; Cut h (or rational h): quantum of energy (h) in a period of oscillation equal to 2π ; unit of measurement of microscopic angular moments

X66⁸

The quantum comparison would be:

- 1) Particles of matter electrically charged (electrons, protons, etc. ...): they are calculated with all six dimensions (X11-X66),
- 2) Electrically neutral particles of matter (neutrons, neutrinos, etc. ...): they are calculated with exactly 5 dimensions (excluding the time, X44)
- 3) Quanta of interaction, especially photons: they are calculated only with the dimensions from 4 to 6 (they do not include space, except when they interact with matter, releasing electrons)
- 4) Gravitational quanta: they are calculated only with dimensions 5 and 6 (they do not include space or time and are therefore indirectly demonstrable)

An example of the precision of the Heim equations comes from the possibility of calculating the mass of the electron with them (0.51100335 MeV, completely coinciding with the traditional measurement through physical experience).

8. THE MATRIX T

Either "transcendental" or "trans-sector"; is a set of 4 equations which, according to Heim, would completely go out of the space-time dimension⁹.

The matrix T would be included in the 5th and 6th dimensions.

In the matrix T, protons would be more available among the sub-atomic particles and therefore this would imply that the associated electromagnetic component would have the characteristics of a 6-dimensional super-wave¹⁰.

Applying these concepts to the living being, Heim believed it possible that its function in this "spacetime" could be influenced by pulses of electromagnetic waves entering and leaving the **Matrix T**¹¹, with pre-ordered frequencies capable of vibrating¹² in resonance and in phase with those of the organism¹³:

Life as a dynamic evolution on six dimensions, temporally defined in the moment in which it "imprints" the energetic continuum of the Universe.

⁸ The analogy with Aristotle's being-in-potency and being-in-act is interesting

⁹ Like quantummechanical vacuum? (**M. Corbucci**, 1976, theorized)

¹⁰ Such a feature would imply the presence of something other than the cosmic vacuum: the aether? Dark matter? What else?

¹¹ DNA-Ecosystem Interaction: **Epigenetics**

¹² Undulatory theory of matter?

¹³ Waves that, in the living tissue would propagate both 'inward' through interactions with the ecosystem, and 'outward' through the 'experience-memory' that the living organism in question would have acquired as part of a 6-dimensional system thanks to the T-Matrix (it would be in contact with the Universe)

9. THE MATRIX, AN ENERGETIC PIANO?

Life, therefore, in its limited temporal duration in this system of space-time coordinates to which we give the name of Earth, should therefore have a code capable of acting as a guideline on which to build its path "with minimum energy expenditure". This fact would then allow life to return to the universal matrix from which it originated. Could this code be an extension of the musical one?

I say this because NASA, especially via the Voyager spacecraft, has long since made public the sound recording of the planets and space.

Now, without air, sound in theory should not propagate, at least according to the principles of Newtonian physics and the functional biology of the human ear.

The translation into sound of the breath of a planet, therefore, presupposes that behind there is an electromagnetic impulse (or energetic of another kind?) which, when suitably transformed (according to Fourier?), translates into sound perceptible by the human ear. More simply, without bothering Fourier, could this be the final proof of the existence of an energetic fabric capable of traversing the entire Universe?

If so, then the Diapason, used as a yardstick to tune the notes of a musical instrument, would have a meaning beyond this traditional.

The absolute **La** (which, among other things, would conventionally vary between 430 and 440 HZ; in this I ask the expert musicians of the sector for help) what influence would it have in the short and temporal explosion of life?

From studies made transversally in many disciplines (from physics, to molecular biology, to biophysics, to resonance homeopathy, to physiology, to the studies of the pathophysiology of tumors as well as in less conventional medicines), the human organism would result in the sum of pulsating electromagnetic fields at frequencies calculated in HZ:

ODIES and TISSUES	FREQUENCY IN HERTZ
FAT CELLS	295.8
BRAIN	315.8
COLON	176
HEART	348
DIAPHRAGM	300
LIVER	317.83
THROAT	376
INTESTINE	281
MILK	492
MUSCLES	324
BONES	418.3
PANCREAS	117.3
SMALL INTESTINE	281.6
SOLAR PLEXUS	322
POLMON	220
RENE	319.88
BLOOD	321.9
STOMAS	110
ADRENALS, THYROID, PARATHYROID	492.8

These frequencies would then be translated into organic function by a series of chemical, biochemical and molecular events such as to maintain the necessary metabolic-functional homeostasis of the organism (in this case human).

Who would translate these impulses?

The importance of the hydrogen bond

It is a type of chemical bond that has unique characteristics compared to the others:

- 1) It is stable enough to create solid bonds (think of the structure of proteins, organized on four configurations);
- 2) it is sufficiently malleable to be solved without major waste of energy.

In energetic terms, hydrogen would "lend" an electron to another atom (see the water molecule) without giving up its "freedom of action". DNA is among the macromolecules richest in hydrogen bonds, as well as the entire living organism: this type of bond, which manages to break and reform itself so easily without disturbing the stability of the structure in which it is found, emitting (or absorbing) quanta of energy each time, would it lend itself better to the concept of "sound", "vibration", "resonance". The entire DNA macromolecule, in fact, given its richness in this type of bond, could encode the biochemical-molecular information using an electromagnetic "frequency or vibrational" guideline (energetic in general).

A sort of "energetic piano" with electromagnetic strings, through which to play music through notes

still unknown to us. It indeed turns out to be true (as well as common sense) to think that before any chemically quantifiable reaction, an energetic one always happens, concerning the particles involved in that said reaction.

In other words, in the hydrogen atom, prior to its bonding with the oxygen atom to form water, the electron would make a "quantum energy jump" to a higher value than the base value. A similar thing would also occur in oxygen, but since hydrogen has less mass, this phenomenon would occur at the lowest energy.

Such energy virtue would allow the play of resonances around specific frequencies; a system of "notes" that would give "DNA" the ability to play on a universal keyboard.

Considering that, in this space-time of ours the quantum jumps allowed in the hydrogen atom would be no more than seven, one could hypothesize a score made up of 7 lines and 6 spaces, in which, in addition to the algebraic 1 (the classical notes), the quantum $\frac{1}{2}$ (+ or -) would also matter, not as a diesis but as a real note (Smigliani, 2004; 2013):

If so, the Universe could resonate on thirteen notes, reduced to seven in our space-time due to the intervention of the time factor, which quantifies energy into matter (air).

In the living being, the place where these universal notes might resonate could be the "lake of water" from the extracellular matrix, in which the most "low-energy" metabolic and informational work is done.

10. CONCLUSION

The extra-cellular matrix, therefore, in its incredible capacity for interconnection and support, in which every phenomenon is open, resonant and able to connect beyond time, could also be seen as a kind of energetic soul¹⁴ in perpetual transformation, which does not need data to be interpreted in order to live a life already "self-evident", in which the concept of beginning and end are relative.

The culture of death of our ancestors, therefore, so important and central to their tribal and social life, perhaps had this meaning as opposed to today where, in our materialistic, technological, Neo-Darwinist and transhuman society, terrified of Death, it would be missing.

¹⁴ In the Catholic sense? As a conduit between earthly life and the world of ideas (Plato)? As rational self-consciousness (Aristotle)? In the Parmenidean sense? As a Buddhist Karma? Qi condensed from Yin/Yang? Et cetera!

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