



## **CREATIVITY, SCIENCE COOPERATION, PROGRESS AND RESPONSIBILITY**

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*"The most incomprehensible thing in the world is  
that the world can be understood"*

ALBERT EINSTEIN

Humans used their native background to create, to invent "science" and to use its results in their own life. He or she invented agriculture, a huge industry for all kinds of supplies. Nowadays the entire Humanity is worried about its future, about the resources and the environment. Nature protection, to know the ground of human congenital illnesses became a global effort.

Nature created the models for almost all phenomena; man copied them and put into scientific frame. The scientific results depend on man's nature perception and imagination.

He out of his will created artificial eco-systems, cities, industrial and biological agriculture and a huge extraction and preceding industry for his better living. He created genetic modified organisms, increasing their biological parameters, in animal and plant the productivity in his case to protect his health and to improve his mind and knowledge. For this last purpose man constructed helpers, intelligent machines, being part of his own person (personal computers).

Unfortunately many of the scientific and practical works turned now against man. There is a big dell to improve the destroyed nature to build a new standard of life, cleaner and healthier. The science has the power to solve this desideratum. The creativity has in this big puzzle the main roll.

### **CREATIVITY AND IMAGINATION**

Grotstein (1992) pointed out the multiple faces of human creativity. It is a sublime activity for constructive reasons and art or a pathological one in case of destructive purposes, or somewhere in between for the research.

The science is integrating itself into a personal image of life (Waser, 1991). Creativity enables us to be in contact with phenomena outside of our ego (Martens, 1997).

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Rarely the sciences creativity is an "inspiration" it is a hard work, with many battle and competitions.

It is supposed that in science it is necessary to have imagination. There is already an imaginary outline (Durand, 1984). The tentative to formulate theories about the imaginary part was as an interpreted imposture. To put in a frame the imaginary and scientific creation was not approached experimentally even if from 1609 it was known. Johannes Kepler (1571 – 1630) was a solitary researcher with a strong imagination. He was obsessed of the world rational order. He supposed that "*the mathematics is the commune language between man and the Divinity expressed in nature*". He believed that the earths as well as all planets are spherical, that the earth as the humans has a soul; it is breathing, and can get ill. And his ideas are valuable in our days. The earth gets more and more ill due to our daily anthropic activity.

But the humans are social creatures. They enjoy talking, sharing the knowledge competing and wining.

The history of science passed from right to wrong hypothesis, from the glory to neglect. The neglected lows or theories were formulated too early to be understood.

One of the oldest and most fascinated questions was:

"What is the infinite sky with its stars?"

"Is the universe substance eternal?"

At first, it was considered eternal. But now it has been demonstrated that it is not.

The universe substance is under a slow disintegration process. The disintegration speed is the same as the proton life period ( $10^{32}$ ). This predicted time is much longer than the actual universe age (Nicolescu, 2002).

Not far away from our days the scientists were sure that the life of protons and electrons (Stoney, 1891) are stabile and their life to be infinite.

The universe matter as life matter is finite.

All of us are dreaming to be eternal. But eternity is a metaphor and it depends on many thinks. Eternity was created by our mind. It exists as far as somebody has the capacity to understand the creativity value, to be interested in it, as long as one searches and science exists. It means as long as actors and communication exist.

As time passes our control of living processes *seems* absolute. For the coming generations it will be possible to do anything: to create novel life and intelligent novel life.

In this case will be life eternal?

Life is built on the DNA molecule.

Is the DNA molecule eternal?

Yes it is as long as it is integrated "*entire in the whole*" (Anaxagoras, i.e. 500 – 428 BC). Other beautiful explanation contains the Bible "*it has to die to be in life*"; it means to pass from a strain to two and from two to four and so on to infinite.

The nucleic acid multiplication propriety is the core stone for infinity and diversity.

**LIFE'S DIVERSITY**

Life is the domain in which diversity acts up to the paradoxical. The small infinite: the cell and its components or the large infinite: plants, animals and we, Homo, are invaded by complexity.

Morin (1977) pointed out a skeptic vision upon the Humans. His message suggested the black face of diversity: "at first the complexity was.... the contemporaneous MAN pass through it as a stranger in a more and more inexplicable world". To day the inexplicable world is more complex and more hostile to him.

To understand the complexity we have to glance at Darwin's (1963) pigeon studies. The analysis is closed in a frame with a specific orientation depending on the place where the analysis is made. It means that the DNA information depends on environment. It is a simple and beautiful formula:

$$P = G \times E \quad \text{i.e. } \begin{array}{l} P = \text{phenotype} \\ G = \text{genotype} \\ E = \text{environment} \end{array}$$

The life's relation is as simple as Einstein's relativity relation:

$$E = m \times c^2 \quad \text{i.e. } \begin{array}{l} E = \text{energy} \\ m = \text{mass} \\ c = \text{light speed} \end{array}$$

Despite apparent infinite live diversity and complexity there are a few common powers - criteria. An immense assembly is life but it stands on the DNA unique matrix in a perpetual movement an energetic rearrangement and relativity. This quality of life is implied in differentiation and diversity, generating hierarchical levels formation, relatively apparent independent systems rising, and quality local configurations.

Different systems are organisms ensembles resulted from environment interactions. It is not possible to reduce to zero the environment influence. To stop the genotype/environment interaction means death. A life system is not a sum of its parts. The interaction among individuals or the interaction with other systems creates an open system.

The open systems interchange generating degeneration at last the death of some of them and the rise of others. In this way are constructed systems of systems to construct the life evolutive diversity. The opened systems are acting as "*coordinator models in the nature hierarchy*" (Laszlo, 1981).

Having in mind Einstein's affirmation "*The most incomprehensible thing in the world is that the world can be understood*" the only one irrational aspect consisted in the world rationality. His believes was "*the knowledge is a metaphysic attribute, the first one accessible human thinking offered by God*".

In his daily activity the scientist is surprised to see the concordance between his abstract models and the experimental ones.

The natural systems are themselves making; their creation is in time, evaluating or coevolving. There is not balance in the natural systems. The loss of balance prevents degradation and finally death.

The loss of balance, the fluctuation, and the variability become the spring of evolution and creation (Atlan, 1979). The live systems self organization and self creation are the result of liberty that is limited by the own genetic information and the compatibility with the WHOLE necessity.

The *unity in diversity and the diversity trough unity* is the message of live natural systems.

These short considerations are enabling to illustrate the whole treasure of contemporaneous biology, ecology chemistry economy and sociology approach.

### **AN UNUSUAL RELATION, COLLABORATION**

Even if there is an ancestral competition in science and richness, the humans return to an old practice, to be together when real important things have to be saved.

At first we have to establish the differences between *real* and *reality*. The *real* represents something that exists but as a definition it is hidden. The *reality* is linked to our human resistance and depending on it; it is accessible to be known.

In science there are levels of reality in permanent evolution.

Life or universe systems assemblies are permanently under general lows action (Nicolescu, 1983).

The best example from biology is the DNA autocatalytic and heterocatalytic functions. In the both cases an informational flux to each reality level is transmitted. In both situations there is a direction of coherent information transmission stopping to the highest and lowest level. Now it seems simple. But for this knowledge a huge team of scientists worked hard. DNA was first discovered in the late 1860s. It was 80 years before its function was properly appreciated. Another decade passed before its three-dimensional structure was worked out as fruitful collaboration. The work group was Watson-Crick-Wilkins and Rosalind Franklin (1953). Last year, 2003 in Melbourne the "*Genetics Olympiad*" took place. As "*Sport Olympiads*" it was dedicated to "*Genomes > the Linkage to Life*".

130 years elapsed from DNA discovery to its manipulation in plant and animals, and finally in humans. Gene transfer was first broached in the early 1970s but it was an unpractical work.

As knowledge of the universe expands, so do the mysteries and perceived opportunities. Volitive the reality is prolonged in the knowledge area through our experience, representations and interpreted results and mathematic legislate.

The human genome was decrypted earlier due to the competition between *Celera Genomics of Rockville, Maryland* and the public funded international *Human Genome Project (HGP)*. Two team different strategies have reignited the debate over the relative merit and cordial joint to announce their success. It was really a great success and they run-up and work hard in an attempt to ensure that history would judge them to have made the more important contribution. Maybe it was too soon to realize the practical importance for human health-care. In 2003 the *Royal Swedish Academy of Sciences, the Swedish Academy, Karolinska Institute, and the*

*Norwegian Nobel Committee* other subject for the *Nobel Prize* aware was chosen.

### **THE END OF SCIENCE**

John Hogan (1997) in his controversy book *"The End of the Science"* pointed out the three 20 Century huge intellectual constructs: the Relativity Theory, Quantum Physics and the Genetic Code discovery. His dilemma consists in the question *"did the scientific knowledge reach its limits?"*

The scientific research in detail is not in discussion. It takes years and years to know the whole genetic background. The intelligent novel life will be able to create another level of intelligent novel life, but their understanding can never be absolute. That is a logical impossibility.

Nature does what nature does.

All things have a finish and this point of finish is the beginning for something new.

Present-day the sciences and technologies may be promising more than they can yet deliver, but they will remain on humanity's agenda forever, and along the Centuries the promises will be superseded more and more by reality.

Science is a discovery, and discovery opens a range of alternative paths to society. Science is certainly a significant contributor to economic growth. But the most important reason is to link scientific research more closely to the social results that we want to achieve; science always benefits humanity.

If it has to be an end than it would be the point where the human spirit has the capability to discover fundamental Universe Laws.

### **WHAT SHOULD WE DO WITH THE SCIENCE'S POWER?**

The XXI Century is dedicated to biology. The human health is the main core and all other activities are focused to his better future.

Biotechnologists are already at work on "designer crops" with different specificities for all purposes. Even if many further decades are needed to create a "designer baby", we are allowed to dream about it now.

We may dream of any feat of biotechnology that does not break what Sir Peter Bryan Medawar (1960) called "the bedrock law of physics" or to ignore the logic rules.

At present new partnerships among academy, government, and business have to be done to transfer knowledge about research, and the ways in which each change affects all the others. Isabel Stearns underlines that "growth rationality is not only man's propriety but also that of the Universe".

It is an ancient principle "noblesse oblige" that those who have power are obliged to act morally in direct proportion to their power.

We have to assume our responsibility for our scientific results.

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