

## Low Power Society

*That government is best which governs not at all; and when men are prepared for it, that will be the kind of government which they will have.*

*Henry David Thoreau*

*The fossil fuels took multimillions of years of complex reduction and conservation, progressing from vegetational impoundment of sun radiation by photosynthesis to deep-well storage of the energy concentrated below the earth's surface. There is a vast overabundance of income energy at more places around the world, at more times to produce billionsfold the energy now employed by man, if he only knew how to store it when it is available, for use when it was not available.*

*Richard Buckminster Fuller*

## Three civilizations – family, food, memory and energy

*It's a poor sort of memory that only works backwards.*

*Lewis Carroll*

In 1964, looking to define a criterion for the identification of extraterrestrial life and possible societies in other planets, the Russian astrophysical scientist Nikolai Kardashev created a classification table identifying different civilization stages in terms of energy consumption, which would later be popularly known as the *Kardashev Classification Scheme*.

His classification established three great categories.

The first category of civilization would be able to control all types of energy from its own planet. Thus, such a civilization could easily change and operate weather, tectonic movements, and extract all its energetic needs from the planet. In such civilization, the need of energetic resources would be so high that a very sophisticated system of communication between its inhabitants would be imperative – as the physicist Michio Kaku demonstrated always with great clearness.

The exploration of planet's energy would also implicate a great refinement of knowledge, turning possible for that civilization to manage the complex and chaotic chain of environmental events.

The second type would be the one for which planetary energy would no longer be enough, obliging it to control stellar energetic sources. Its

needs knew a big expansion, beyond the planetary capacity, leading to use its solar system's star as source of energy.

The third type of civilization in energetic terms would be the one for which even the energy from a star would not be enough for its needs, obliging to an expansion of consumption in a galactic scale.

If our energetic consumption will continue growing as it has happened at a rate of 3% per year, without acceleration, it is estimated that we will reach the *Type I of Kardashev Classification Scheme* in one to two hundred years.

Keeping, after then, stable the energetic consumption growth, *Type II* could be reached in about eight hundred to one thousand years, and *Type III* could be reached in a period of about ten thousand years.

It is an astonishing hypothesis if we consider

that only ten thousand years ago we still were in Paleolithic, giving the first steps to start the Neolithic!

That energetic classification also alerts us to the fact that along History every civilization leap implicated an increase of energy consumption.

Fred Cottrel, social scientist at the University of Miami, defined the thesis established in his book *Energy and Society*, dated of 1955, with a decisive statement: «the energy available to man limits what we *can* do and influences what we *will* do».

Any civilizational development implicates, in some way, an increase of energetic consumption.

Even the production of ideas implicates energy consumption through its supports and accumulators. Papyrus, parchment, paper and silica, in their most diverse uses, are clear examples of how it happens.

The structuring of ideas as a biochemical process in our brains also is energetic consumption.

Going a little beyond the abstraction of the world of *pure* ideas, the invention of clothing made possible a more efficient energetic storage inside our bodies and, thus, it also generated more intensive and efficient consumption of energy, liberating our time. Free time turns free thought possible. Without clothes, we would be obliged to eat larger quantities of food more times every day.

The control of fire surely was the first revolutionary factor that projected a logic of concentration and produced *Homo Sapiens*.

For years it was considered that the control of fire was reached for the first time around five hundred thousand years ago by *Homo Erectus*, *Homo Sapiens'* ancestral, in China – as it was

evidenced by archaeological evidences in a complex of caverns at Zhoukoudien, near Beijing, in 1930s.

Later, several archeologists challenged that possibility demonstrating that the controlled use of fire could be confirmed in archeological sites in Kenya and South Africa dating around one million and five hundred thousand years ago.

Adriaan Kortlandt, ethologist from the Netherlands, developed a fascinating a revolutionary thesis according to which big apes' ancestral were, in fact, very similar to human's. They were persecuted by proto-humans and obliged to take shelter in trees, conditioning their evolution. To Johan Goudsboum, sociologist at the University of Amsterdam, the control of fire would have exerted a fundamental rule in that event.

That is, the principle of concentration generated by the control of fire probably was one of the factors responsible not only for the emergence

of human but also for the appearance of apes, in a technological evolutionary process that projected different species.

Curiously, like what happens to the principle of molecular structuring in wood, the control of fire implicates a logic of concentration.

Fire is an unstable phenomenon, of easy propagation, with a strongly destructive nature, demanding great concentration of attention and knowledge for its manipulation.

Thus, fire control techniques not only implicate continuous attention, demanding immediate solutions for unexpected problems, but also their synthesis in terms of method as to make possible transmission of knowledge from generation to generation. The control of fire produces, inevitably, a process of education, of knowledge.

Michel Foucault said that «power must be



analysed as something which circulates, or rather as something which only functions in the form of a chain. (...) Power is employed and exercised through a net-like organisation. (...) Knowledge and power are integrated with one another, and there is no point in dreaming of a time when knowledge will cease to depend on power. It is not possible for power to be exercised without knowledge, it is impossible for knowledge not to engender power».

In this way, as fire imposes, by its nature, a radical change in the structure of matter – designing a form, a *differential condition* – its control demands a refinement of memory resources.

The control of fire establishes yet the principles of monopoly, of the organized violence and of taxation – as demonstrated by Norbert Elias.

Control of fire made possible a substantial increase of food energetic storage as food and

with it the sedimentation of the phenomenon we would call *family*.

But, mysteriously, the word *family* – derived from Latin *famulus*, which meant *servants* – would only appear in the 12<sup>th</sup> century, when Europe started intensifying the use of vision and phonetic alphabet through paper.

The expression *family* originally emerged to designate a group of people obedient to a *paterfamilias*, as if it would unveil, thousands years later, prehistoric seeds of that interesting concept, later transformed in *content* of a new medium.

In a certain sense, *mafia* and other similar criminal organizations in Southern Italy preserves the ancient meaning of the word *family*, for which all servers are members.

It would be only after the middle of the 17<sup>th</sup> century that the word *family* started indicating a group of people formed by parents and children!

Even under a cover of obscure past, the term *family* possibly recalls its etymological origin from two Latin roots: *fas* that means “divine law” and *for* or *fari* meaning “to speak”. Since a long time, diverse scholars have proposed a connection between these two roots, which was enthusiastically reinforced by Émile Benveniste, a French linguist who lived between 1902 and 1976 and who was a dedicated follower of Ferdinand de Saussure’s ideas.

However insistently attacked by other scholars, the connection between *fas* and *fari* would be definitively confirmed after a more attentive analysis of some Greek words older than Latin.

Despite even more distant in time, it is possible that another clue for the comprehension of a link between those two roots – connecting *speech* and *divinity* in the formation of the idea *family* – could be found in the Sanskrit *vac*, which

indicates, simultaneously, *voice* and *divinity*.

One of the Greek terms that unveils the enchaining of the Latin roots *fari* and *fas* is *pho.ōs*, which means “light” and that launches itself to the Indo European *\*bha* that, in its turn, indicated the idea of *energy*, of *movement* and of *light*.

Thus, even if hypothetically, it is possible that the word *family* have appeared from the fusion of the ideas of *divine law*, of the *speech* that connects people, and of *light* or *energy*.

The creation of ensembles of interconnected people, with more implicitness in their relations, the use of fire, a larger consumption of energy and the consequent increase of food production also meant the increase of calories absorbed by human being.

The average efficiency of a naked human body is about 20% – what means that for each hundred consumed calories, only twenty will be used. So,

without any artificial resource of energetic storage like cothes, three thousand ingested calories will result in only about six hundred calories of work.

The use of fire made possible the elimination of toxic substances and too tough fibers, generating great food diversity and, consequently, new sources of proteins, amid and carbohydrates. Thus, contrarily to what is generally believed, the use of fire made possible a great amplification of vegetal food diversity. By its turn, meats passed to be conserved by longer periods of time.

Before the use of fire, chewing of vegetable with too tough fibers would have demanded a considerable muscular effort, provoking a *brachycephaly* – reducing skull’s volume. With food turned softer with the use of fire, the release of muscular compression would made possible a notable increase of free space for brain expansion.

On the other hand, Stephen Cunnane,

nutrition and brain metabolism researcher at Sherbrooke University, in Canada, defends in his book *Survival of the Fattest* that the increase of calories ingestion was an essential fact for human survival in prehistory: «The human brain evolved because certain hominids stumbled serendipitously across solutions to two major constraints on primate brain size and function, one a *metabolic constraint* and the other a *structural constraint*. The unique cognitive potential of the adult human brain emerged as a direct consequence of evolving neonatal body fat as insurance against the metabolic constraint – the voracious fuel needs of the infant brain. Neonatal body fat improved the fuel supply to the brain by providing an alternative fuel to glucose in the form of ketone bodies. Ketone bodies magnified the potential for more sophisticated communication between neurons, but only because the habitat and diet permitting the development of body fat simultaneously provided a richer supply of brain selective nutrients. These nutrients met the need for additional membrane complexity, which

released the *structural constraint* on neuronal connectivity».

Ketone is the designation for a functional cellular group characterized by a strong and specialized connection of carbon atoms.

It would be the energetic accumulation through new techniques of attention, clothing, memory, nourishment and food conservation that permitted to the hominid brain become human.

The gradual passage from nomadic to sedentary human being with the emergency of agriculture nothing more was than the amplification of energetic resources – fact that later would make possible the appearance of the city.

We started using energy for the most diverse purposes, and *consuming* more energy in the most different ways – what, in fact, simply means that we started *transforming* larger quantities of energy.

Along thousands of years we became used to deal with this phenomenon of increasing energetic consumption, at the point we considered it perfectly natural.

But, especially after the second half of the 20<sup>th</sup> century, in great part because of a global demographic explosion, the idea of increasing energetic consumption as civilizational indicator quickly became taboo. The justification was to avoid judgments of value and power games.

Thus, the narrow relation between energy and memory was left aside.

In fact, what we call *memory*, in general exclusively associated to some of our neuronal functions, is present in everything. First of all, it is a phenomenon of physical nature. Memory nothing more is than the establishment of *form* – what means, in other words, that it is about the establishment of *identity* elements.



When an animal prints a step on a piece of adobe softened by water, it becomes *memory*. The same happens when someone paints an image, when we write something, when a flash breaks a stone, when an earthquake draws a new landscape and so on.

Memory is the time, or duration, of what we call *order* or, simply, *differentiation*.

The exercise of memory, as the act of elaboration of *form* complexes, or *differentiation*, became more and more sophisticated along thousands of years.

*Sophistication* means reduction of scale, more acuity, something like knowledge *miniaturization*.

The word *sophistication* appears from the Greek *sophos*, which means “wisdom” and that also generated – perhaps through Pythagoras’ hands – the word *philosophy*.

Every question involving knowledge has a common denominator: *scale*.

But, memory is not only pure determination of a space time moment. It is a permanent act of creativity, because everything is changing, always. No differentiation is closed in itself. Anything different implicates the *Other*. And what we vaguely determine as the *Other* can only be vague, because it is of a dynamic and complex nature.

By the same reasons the system we call *life* is extremely dynamic, also any system of memory is the confrontation of different *formations* – or *attractors*. Therefore, memory and cognition are inevitably and strongly interlaced.

Any life is a kind of memory – and all memory implicates energy consumption, because all *formation*, all establishment of *form*, any *action*, essentially has an *anti entropic* nature.



standards.

Despite sometimes through less evident ways, every civilization indicator is always related to the generation of form and, consequently, to energy processing.

Even a *Buddha* will need energy to be alive. Thought formation implicates form structuring. This is one of the Zen elements: we are alive.

With texts collected in the 3<sup>rd</sup> century, the *Damaphada* – book that, to many, assembles teachings directly dictated by Buddha himself – affirms that «our life is the creation of our mind» and that «foul and ignorant people are not attentive or observing; but observing people consider it as their great treasure» – life and establishment of *form*.

In general, we approach very cautiously questions related to energy consumption, as if they would inevitably affect our lives in a negative

way and, especially, the balance of our planet. In this sense, the less energetic consumption, better it would be.

This happens because, in first place, we approach energy consumption taking the second fundamental principle of thermodynamics – *entropy* – in partial and absolute way. In second place, because we normally consider energy as something material and extinguishable, with finite nature, like what happens with resources related to fossil fuels. Finally, because we generally consider ourselves beyond Nature and we don't take ourselves as an integrating part of it.

In fact, in a determined scale, it is possible to exist one or more mad people desperately decided to consume a so huge quantity of energy to the point to unchain a devastating planetary environmental catastrophe, not conscious to be committing suicide and a murder at a planetary level.

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absurd acts constantly committed in environmental terms all over the planet along thousands of years, I believe in the human being, in what we call *Humanity*. And, I believe in the Humanity as an essential part of Nature, not isolated from it.

Energetic consumption does not obligatorily implicate global warming or pollution – but it means, always, transformation, change.

In the same way I consider *energy* as *memory*, part of the process of Nature, I also consider everything we call *artificial* as to be part of this same process – not something new and dangerous, but a dynamic and mutant process.

It is not about to be optimistic or pessimistic, good or bad, wrong or right, but, simply to observe History, the differential data we reached after thousands of years, and notice that, despite the horrors, the persecutions and the most varied tragedies, inquisitions, wars, murders, horrible crimes, all actions of desegregation, Humanity

also have had enlightened souls, poets, scientists, philosophers, musicians, architects, thinkers, fabulous artists – all them aggregation actions.

The mysterious network that gives us the sense of unity and reveals that formidable enlightened human face would be illustrated by the concept of *serendipity*: when discoveries happen by *chance*, so many times simultaneously, in diverse parts of the planet.

A phenomenon that, sometimes under different angles, brought Teilhard de Chardin to create the concept of *noosphere*; Wyndham Lewis to coin, in his classical *America and Cosmic Man*, dated of 1948, the expression *global village*, later popularized by Marshall McLuhan; and Jacques Monod to establish the concept of *ideosphere*, which would be lively embraced by Douglas Hofstadter.

What exists must obligatorily be different, because *only difference generates consciousness*,

as the ancient Indian thoughts of the Vedic tradition showed us.

Any establishment of *form* implicates the discovery of differential elements. All difference is established according to principles, and these principles are interconnected.

When we change the logical structure, we change everything, the whole comprehension, all effects, all actions – but we continue talking about Humanity and Nature.