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Outsourcing Life †

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Abstract: Humans have always been inspired by the living, representing, simulating, and emulating it. Today we are witnessing the extension of life into a "Third Life"—the "First Life" being the biological life and the "Second Life" the life in the symbolic dimension—that expands Nature. This process is consistent with the progressive externalisation outside the body of human functions and activities, in the beginning of body parts, then of knowledge and memory, then of activities and labor, and finally of some narrow reasoning and autonomous action. In the future, increasingly human activities will be externalised, evolving into Third Life.

Keywords: life; nature; third life; second life; first life; symbolic dimension; digital

1. Life and the Digital Language

In a comparison between an analog and a digital photograph, in enlarging both pictures neither image, albeit at different magnification scales, shows continuity or regularity but rather discontinuity. Both images show patterns of discrete, non-continuous configurations. The difference is that in an analog photograph the form and the size of the silver salt grains that codify and compose the image vary all along the photosensitive surface, while in the digital photograph the shape and the size of the pixels are the same all along the picture's surface. Therefore, the distinction between "discrete" and "continuous" cannot be considered as absolute in differentiating between analog and digital, since it is a function of the magnification process: it depends on the scale and the resolution at which the phenomenon is considered. What emerges from this comparison can be extended to a more general purpose: both analogue and digital are discontinuous, discrete. The difference is that digital is "discrete regular" and analog is "discrete chaotic" or "unordered" (Figure 1).

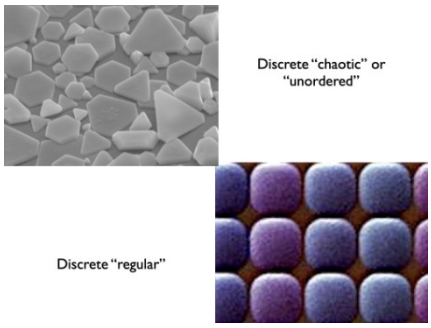

Figure 1. Analog and digital discontinuity.

Life is the event horizon in human activities, and also the digital echoes the organic/living realm. The basic system of a computer's hardware is named BIOS (Basic Input Output System), a set of fundamental software routines that operate the first series of basic

check for updates

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controls and commands during the boot process of a PC. If, in this process, something goes wrong, the PC cannot start. Therefore, forcing a metaphor, as a set of instructions that powers on the PC, BIOS *gives life* to a machine. In Greek language the word *Bios* means "life", referring to a specific life (it is the root for "biography"), and all the disciplines concerning the living systems are bio-based, while *Zoé* refers to life in general (it is the root for "zoology") [1].

The digital and the organic are converging and cooperating in many fields, for instance in bio-robotics, in biological chips and circuits, in technologies to intervene on DNA, in synthetic biology, and so on.

2. Organic Life: The First Life

Life today can have many flavors. The first one is the biological life, the life inherent to the organic realm, as a carbon-based entity, as it is on Earth. This idea of life has been extrapolated as universal, and in searching for life outside Earth the organic compounds are considered as the basic blocks [2]. In fact, the astronomers have detected the presence of complex organic molecules in a protoplanetary disc surrounding a young star [3], while the *panspermia* hypothesis is reinforced by the discovery of organic compounds on comets, such as on the Churyumov–Gerasimenko [4].

Over the centuries many disciplines have attempted to define the boundaries of the living. In fact there are many definitions, but they are not exhaustive. Viruses are an example of this uncertain situation, since they are located at the edge between inorganic chemistry and life, and for decades the scientists have debated whether or not they should be considered as living. Viruses are ancient entities which affect all life forms on Earth, they are often responsible for the birth and the extinction of species. They have played and play a fundamental role in evolution. According to Luis Villareal [5] (p. 102):

> So life itself is an emergent, complex state, but it is made from the same fundamental, physical building blocks that constitute a virus. Approached from this perspective, viruses, though not fully alive, may be thought of as being more than inert matter: they verge on life.

This "verging on life" is intriguing. Is life some sort of a terminus ad quem? Is it a sort of a continuum? Is life something to which to tend?

The life of the organic-based life forms can be named the "First Life".

3. Life in the Symbolic Dimension: The Second Life

Beyond the "First Life" it is also possible to define a "Second Life" (that, is not the 3D virtual world), that is the life in the symbolic world. In humans symbolic acquisition gave rise to communication forms and tools such as indexical signs, oral language [6], images, and writings, in all their derivations, until the *technologies of distance*, from antiquity to today's *mediascape* with the Internet, social networks, and smart devices. The evolution of humanity could be interpreted as a continuous and tireless research to communicate ever faster, ever further away, in an ever more extensive, reliable, and economic way. Additionally, let us note that today's technologies of communication are still based on the mentioned four primary modes: indexical signs, oral language, images, and writings [7].

Through the symbolic ability humanity has partly removed the direct physical experience of the phenomenal world by delegating this relationship to models, artefacts, and representations, and has embarked on the path that has led it to today's technological achievements. Thus, the hiatus with the "real" world has expanded; its borders with the symbolic habitat have become blurred.

Thanks to the symbolic habitat, different from the phenomenal one but as real as it, using it as a filter, cognitively, and as a prosthesis, humanity has achieved three fundamental goals vital for survival and success: *protection* from the real world (thanks to a safety distance); *knowledge* of the real world (thanks to the use and sharing of symbolic models); and *effectiveness* on the real world (thanks to the artefacts that have arisen from these models) [8].

In the Second Life people pass a long time; meet and stay in touch; have fun; share passions and visions they increasingly base their knowledge on; sign documents; make some of the most important decisions in their life... Billions of people worldwide live in this habitat today and will live in it more and more extensively in the future; the COVID-19 pandemic has highlighted this dimension.

The Second Life is a typical human construct, made by humans for humans. It only exists because of them. It is their peculiar world and their genius.

4. Life in Outsource: The Third Life

From the Second Life some sort of a "Third Life" can emerge. Humanity has always been inventing and representing new life forms. Gods and heroes are present in religion and mythology, and then unicorns, dragons, centaurs, chimeras, cyclopes, and sirens. Imaginary figures exist in all cultures, highlighting the special human ability in creating symbolic worlds that only live in the collective imaginary through orality, pictures, and writings. Heroes, characters, and legendary creatures also recur in today's narratives, movies, and video games.

Humans have always been influenced and inspired by the living and they have always been trying to simulate and emulate it. The thrust for creating real living entities has been pervading the whole human history in many cultures, from the Greek Talos to the medieval, Renaissance and XVIII century automata [9], until the contemporary robots—the "children of our minds" according to Hans Moravec [10]—and the biological organisms. Machines have become increasingly powerful, able to survive damages, to self-repair and to autonomously work in and adapt to the environment to interact with unexpected situations and hitches like the living normally do. They simulate the living because it is the best model; it has demonstrated its efficiency in the last four billions years of evolution, and it has experience of the world. Some machines are presenting behaviors that are similar to the living. In parallel, since the Neolithic period, humanity has really been creating new life forms by selecting and hybridising animal and vegetal species, until today's varieties that would have never evolved outside the human culture. Therefore, current disciplines such as Robotics, Artificial Intelligence, Artificial Life, Synthetic Biology, Genetic Engineering, Biotechnology, and De-Extinction are expanding the boundaries of life and evolution. Life is becoming a complex scenery with organic, inorganic, and mixed living forms. A Third Life [11] that expands Nature from within its own domain is originating from the human culture (Figure 2).

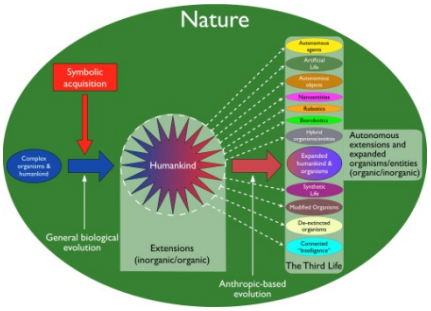

Figure 2. The Third Life.

The rise of symbolic intelligence in human ancestors generated an explosion of tools, artefacts and devices that deeply changed interaction with the environment, shaping the anthropic world that we know. According to McLuhan, they are extensions of the body, of the senses, and of the nervous system [12]. Sometimes we are in such a deep relationship with machines that we can do with them what we have never been able to do with humans; for instance, communicating with thought. Now we are going beyond the McLuhan's extensions era, since increasingly complex and autonomous forms are emerging, and because of the anthropic environment's pressure they are evolving like living entities,

organic, hybrid and inorganic. The Third Life is designed, created, and selected by the anthropic sphere through a cultural process.

This process is consistent with the progressive externalisation outside the body of human functions and activities. In the beginning, with tools and weapons, of body parts; then, with pictures and writings, of knowledge and memory; then, with machines and more or less automatic devices, of activities and labor; and recently with Artificial Intelligence, Robotics, Artificial Life, algorithms, of some narrow reasoning and autonomous action (Figure 3). If this trend goes on in the future, more and more human activities will be externalised, and the outcomes of the human culture will become increasingly independent, evolving, as noted above, into Third Life. Transdisciplinarity, complexity, and awareness are at the basis of imagining, participating, and designing in such an evolution.

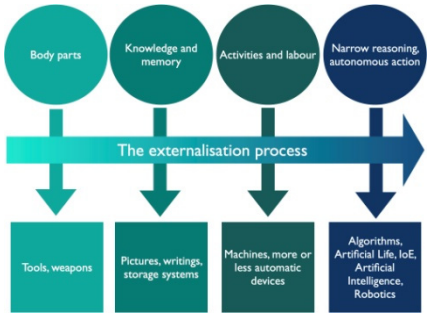

Figure 3. The externalization process.

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