

ON SURVIVAL AND TRANSCENDENCE

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Observing a word, a number, a sound, a gesture, a feeling, an image, a natural fact, indeed every sign, our senses are activated and physiological mechanisms inform us. This is the action of the **body (brain)**. The information is simultaneously complemented by an "inner voice", a result of memories, experiences and something more, unexplained (can it be another sense? can it be what is generally called intuition?). This is the action of the **mind**. How body and mind relate is the focus of the emerging science called **cognitive neuroscience**, perhaps the greatest challenge of the theory of knowledge. The resources of this extremely complex science are surprising. I mention as an example the research of Peter Godfrey-Smith, an eminent philosopher and

historian of science and biology, whose latest book explores oceanic origins and evolution of cognition and mind and body from research with octopuses.

This curious research program illustrates the complexity of an emerging specialty, which is the cognitive neuroscience. Ophelia Deroy, prominent specialist in philosophy of mind and cognitive neuroscience says in a review that the search of Godfrey-Smith is compelling and challenging current ideas about conceptions of mind and mind-body relations.¹ The foundations of neuroscience are, in the sense of resorting to what is called **nebulous logic** (or fuzzy logic). In nebulous logic, the value truth of a proposition may be an element of an ordered set, for example the real numbers, while in the binary logic system, the only two possibilities for a proposition false or true.

The distinction may be explained in the following way. In the binary logic, currently the “official” foundation of the theories of knowledge, the resort is the well-known Aristotelian truth table. It must be decided if a proposition is false (attributing to it the denomination F or the numerical value 0) or true (attributing to it the denomination T or numerical value 1). So the “traditional” researcher plays with only two possibilities: 0 and 1. In the nebulous logic, the “insubordinate” researcher plays with the entire interval: any number between 0 and 1. In this “nebulous definition”, I appeal to linguistic expressions to clarify. The research in nebulous logic has options like unconditionally false (=0), sometimes false, may be false or true, and many other mixed options, up to unconditionally true (=1). So, a proposition may be 0,75 true. This brings to mind the position of what we may consider a pioneer of this nebulous logic: the goddess *Morias*, or *Moriae* or *Stultitiae*, the voice of Erasmus of Rotterdam in his masterpiece *The Praise of Folly*, written more than five centuries ago. Precision, rigor exactness may lead to radicalism to intolerance, to conflict. Erasmus calls for tolerance, reconciliation, peace.

¹ Ophelia Deroy, *The intelligent invertebrate*, *Science* 354 (6316), December 1, 2016, p.1110.

Despite not having a well developed theory of cognitive neuroscience, it is possible to interpret the records of past and present that helps to understand the strong presence of signs and symbols, which are anchored in the traditions of signs a group, in the elaboration of knowledge, as evidence from the earliest hominids. Indeed, signs are present in all living species, as a way of influencing others as manifestations of hostility or harmony and agreement. In the *Homo* species, signs appear as cultural manifestations of knowledge, of behavior and style, and of mythological, religious and social values. In the same cultural environment, it is not necessary to explain the meaning of a gesture, of an engraving or of a word.

The process of evolution of species is universal, it occurred since the beginnings of life in Earth. This is the essence of Darwin's theories. How, where and when did the species *homo* appear? There is support to the hypothesis that hominids had origin in Africa about 6 million years ago, in the region where today are Kenya and Tanzania, and migrated throughout Europe. They later sailed, reaching regions that today we call Oceania, Pacific Islands and the Americas. There is no consensus on common ancestors. It is also accepted that hominids evolved in all corners of the planet. In this process, there are specifics such as *homo neanderthalensis*, best known for their presence in Europe. This process is marked by local groups generating and organizing behavior and systems of knowledge, which constitutes the essence of the culture of the group, which is expanded and acquired by other local groups by a dynamic of cultural encounters. Everything converges to the *homo sapiens* and to our current stage of evolution, which is the *homo sapiens sapiens*.

How and why did this whole process evolved ? How can we identify the beginnings? Historiography is dynamic and it is permanently modified. New technology and new sources correct possible inaccuracies in dates, people and interpretations. Frequently important things are missing, new

stories are merged, others are preserved, forgotten and recounted and others are invented. This is a good example of a nebulous discipline.

In this process I highlight some steps. The ability of bipedalism is the first major differentiation of the human species among other primates. Bipedalism represents a mental breakthrough because standing and moving requires a complex coordination of anatomy and the recognition of the centre of gravity of the body.

Struggle for food was essential. Thanks to bipedalism, hominids competed favorably with other larger animals in the process of taking the carcass left by larger hunters, a main source of food, to secure locations. It is easy to agree that it is faster to run with two legs holding something in arms and hands than in jaws. Shelters, as secure locations were mainly caves, soon perceived as safe places to protect the food and kins from predators. Fire was discovered and controlled and became a major protection in caves. Caves were the earliest forms of housing for groups of individuals. Conviviality in caves was a fundamental step in the emergence of language and of the first manifestations of culture. Although there are no caves in certain geographical regions, like the tropical jungles and the Arctic and Antarctic circles, some creative equivalents to caves were developed. Igloos, excavations, near trees, and several other gimmicks are examples of primitive forms of housing. Recognize the creativity of groups to find safe places is a fascinating study. As I mentioned above, one of the biggest difficulties in this study is the lack of sources. In regions where there are few or none stones, there is no preservation of artifacts from the remote past. The difficulty of access to sources results in much emphasis of research on lithic cultures. For non-lithic cultures, we depend more on suppositions based on traditions.

An important step in the development of lithic cultures was the process of chipping rocks to fabricate instruments, with the specific objective of assisting in securing food and protection. The use of stones as tools, including

a natural way of learning from your use, is an important step in the evolution of primates. There is even a social process indicator for the transmission of this knowledge, which would be an early form of teaching. This is a sophisticated form of manufacturing and using tools that reveal important advances in skills and learning and even in teaching.²

Fire, the art of chipping rocks and stone artifact were responsible for changes in the eating habits of humans. Recent research suggests that the practice of shaving a bone incorporates important minerals that may have been decisive in the differentiation of the human brain with other primates. Nutrition studies in prehistory, based on research of bones, dentition and coprolites, are fascinating and clarify about the evolution of the human species.³ The art of manufacture of instruments and control of the fire, and the consequent development of language, represent important cognitive and social advancement.⁴ It is important to observe that to chip a rock was necessary to develop concepts of size and weight, which reveal the abstract concept of dimension in planning the fabrication of an instrument. This is an important advance in the cognitive capacity of the species.

I somewhat digress of my main subject and make some considerations about the emergence of governance, power and leadership. Kins were together in small settlements, sharing nourishment and shelter. Most probably a member of the group, selected in different ways, was the “governor” responsible for the main decision on matters concerning the interest of the community. The encounters with other groups were mediated by the governors of the different groups. This encounter may lead to conflict, a kind of proto-war, which resulted in the domination of one group over the others

² Satoshi Hirata, Naruki Morimura, Chiharu Houki: How to crack nuts: acquisition process in captive chimpanzees (*Pan troglodytes*) observing the model. *Animal Cognition*, 12, S87-S101.

³ For an extensive and detailed summary of the compiled research on this topic, see Part 1: Determining What Our Ancestors Ate, *The Cambridge World History of Food*, eds. Kenneth f. Kiple & Kriemhild Coneé Ornelas, New York: Cambridge University Press, 2000, pp. 11-71.

⁴ The movie *Quest for fire*, directed by Jean-Jacques Annaud, in collaboration with Anthony Burgess and Desmond Morris, 1981, is a summary of this evolution.

and even to the complete elimination of some groups. But the encounter may have a conciliatory outcome, as a result of empathy, that is the ability to understand others, and of compromise, that is the acceptance of a fair solution convenient for all involved. This needed understanding communication signs, such as gestures and sounds, responsible for the emergence of language and speech as the main instruments of communication. This was an important step towards societal organisation and cohabitation, giving rise to clans and tribes. Tribes started interacting with other tribes through both conflicts and cooperation. The first negotiations and search for compromise appeared. This may lead to the groups selecting an overall head. The agreement therein was a sign of power.⁵

This resulted in the rising importance of military prowess, used to defend territory and also to expand territory. As a consequence, leadership of the group was more commonly attributed to men. With the emergence of agriculture, about 10,000 BCE, the leadership resulted also male dominated priesthoods and scribes needed to administer the complex agricultural societies. Even so, the sacred perception of women as related to the fertility of the land continued to be very influential and even dominant in traditional religions.

With the increased importance of agriculture and the register of facts and events, the prehistoric period changed to history. Written records and named actors recognize hereditary kings, who often claim to be descendent of gods or their representatives in Earth.

I highlight what may be the most relevant step in the neurocognitive evolution of the species *homo*, which is the invention of the spear, which occurred around 500,000 years ago. Spears require an assessment of the strength and direction of the shot, coordinated with the identification of the

⁵ This is well illustrated by the biblical episode of the Babel Tower.

target. This requires an integrated control of anatomy, muscular strength, and the senses, mainly vision, all coordinated to performing a task, in this case hitting a target. The practical advantage for hunting and defense, allowing autonomy and security, the art of spears requires full concentration and mental discipline typical of complex thought, the quintessence of spirituality.⁶

A major characteristic of *homo sapiens sapiens* is the domestication of plants and animals and the development of techniques for achieving production that entirely modified nourishment, myths and social life, being responsible for a new concepts of property, of wealth, of labor and of commerce. Most profoundly than every stage on the evolution of the species, the emergence of agriculture marks a new era in the history of mankind. Agriculture began independently in different parts of the globe, about 10,000 BCE.

This process occurred all over the world, in essentially the same period. Different cultures of different groups, meet, confront or cooperate in many ways. The groups seek explanations and create myths that describe all the steps to agriculture, from the moment of creation of each culture. The myths are organized consistently, transmitted from generation to generation, incorporated in the traditions of the group and in the religions. As an example, I give the episode of Cain and Abel.

The human impact on nature, such as the growth of population, human influences on land use, ecosystems, **biodiversity** and **species extinction**. In all these steps there is an evolution of cognitive processes, the structures of society and geopolitics. The great motivator of this evolution is the pursuit, by each individual, to be alive and to procreate, that is the survival of the individual and of the species; and to look for meaning and explanations, going

⁶ Spears evolved as archery and, not surprisingly, they are somewhat intrinsic to the philosophy and spirituality of Zen.

beyond, transcending, survival. I call these behaviors the **pulsion of survival** (common to all living species) and the **pulsion of transcendence** (unique to the human species).⁷

The basic pulsions of human life, since the earliest hominids in the Paleolithic through the Neolithic, are the struggle to survive and the search for transcending survival through meanings and explanations. Survival consists essentially in the acquisition of ways of dealing with the natural and social environment for nutrition, shelter and mating. The search for meaning and explanations, for the “whys”, culminates in transcendence, which is the formulation of meanings and explanations, a characteristic unique to the species *homo*. Survival responds to **physiological needs**, while transcendence is the response to **psychological will**. In many situations, psychological needs subordinate physiological needs. Suicide is an example of will subordinating need. Will manifests as desires and preferences, acquiescence or opposition, hatred or love, cooperation and retaliation, forgiveness and revenge and many other forms of behavior.

The strategies are generated and intellectually organized by the individual. Through communication in the broadest sense, these strategies are shared with others and are then socially organized. As socially organized strategies, they are accumulated and transmitted over generations, and are usually classified as myths, religions, abilities, techniques, arts and sciences.

The same is true with all the doings and knowing developed as strategies to survive and transcend. They are responses to information received from reality, amply conceived as the complex of all that is material (**artifacts**), as well as all the experiences and memories, thinkings, ideas, feelings, emotions, and all the representations of facts and phenomena created

⁷ I use the word pulsion in the psychoanalytic sense, similar to *trieb* as used by Sigmund Freud.

by each individual (**mentifacts**).⁸ Artifacts are accessible to every living being, in accordance with their senses, while mentifacts are accessible only to the individual who generated them. A mentifact generated by individual “A” will be accessible to others only if it “translated” into an artifact (a gesture, a sound, a sign, a text, an object – art - and many other communicative instruments and devices) which can be recognized by another individual activating sensory mechanisms.

We may consider artifacts as elements of material culture, while mentifacts are understood as elements of mental culture. In mental culture, mentifacts include the **symbols** associated with artifacts, indeed as substrate of artifacts. For example, a construct consisting of two intersecting lines or bars, usually perpendicular to each other and running vertically and horizontally is an artifact geometrically called cross. But it acquires a symbolic meaning in Christian cultures and associated with it a complex of behaviors, values, norms and rules. Mental culture generally consists of a set of **signs** and **symbols**. I will discuss signs as such a communicative device.

I base my arguments on a hierarchy of behavior that leads to individual behavior, which includes learning, acquisition of knowledge and action strategies; and social behavior, that results from exposing an individual to another individual, hence to many other individuals. Individual and social behavior generate the context of cultural behavior, which includes the processes of cultural transmission and the exposure and mutual influence of different cultures, the object of study of the dynamics of cultural encounters.

[7] This was briefly discussed above in the paragraphs dealing with governance.

Preliminarily, I am interested in understanding the process of learning

⁸ I frequently use the terms artifacts and mentifacts. These words, together with sociofacts, were introduced by the biologist Julian Huxley (1887-1975) as the basis for a theory of culture. They are also used in cultural semiotics.

and the acquisition of knowledge and action strategies, which form a hierarchy of behaviors. Initially, take care of individual behavior, which implicitly includes the learning processes and, in particular, the acquisition of language. Meeting other(s) results in social behavior that develops and evolves as part of so-called educational process in its various forms. Therefore, the social behavior becomes more complex and generates a cultural phenomenon. It is essential to understand how the arts and techniques, incorporating artifacts to reality, develop as mentifacts, on ideas such as religion, values, ideologies and philosophies, science in general, which are also incorporated into the reality. In a broad sense, the reality is made up of facts and natural phenomena plus artifacts and mentifacts that are incorporated into it. Every embedding results in modifying reality which, therefore, is never static, is in permanent transformation.

So, it emerges technology, as a combination of artifacts and mentifacts. Technology represents the way man deals with reality and deal with situations and problems. Artifacts, not only as material instruments, such as tools and practices, but also mentifacts, which are abilities and also religion and ideology as substrates of artifacts, are responsible for these actions. An example is the emergence of Gothic in architecture, which combines the material, the ogive construction, and the spiritual, pointing to the sky. A similar explanation for the emergence of perspective. Another example is the art of counting, responsible for *ad hoc* solutions to problems and for situations of everyday life.

Ad hoc solutions are the result of tests and trials, mistakes and successes, and can give rise to methods, which are a systematic, rational and coordinated use of artifacts and mentifacts. Methods lead to inquire about "why?", "how?", "where?", "when?". The answers come in the form of an elaborate organization of mentifacts, which are the theories. To incorporate methods and theories to the reality is accessible to every individual and can be

retrieved when necessary to deal with new situations and new problems. *Ad hoc* solutions to new situations and new problems may give rise to new artifacts and new mentifacts. This is called invention.

History is the examination of the dynamics of the evolution of these steps:

1. How practices and *ad hoc* solutions develop into methods;
2. How methods develop into theories;
3. How theories develop into inventions.

Initially, I will discuss the process of learning as something that creates a context, which is a genetic program interaction with an environment. This is the subject of an important line of research, generally identified as "*nature vs. nurture*".

From the earliest philosophers, this discussion is present. Psychologists have joined the philosophers on the relative importance of the environment, *i.e.* experience, learning and teaching ("feeding" the evolution of each individual), and heredity, *i.e.* genetic inheritance (nature). The implications of these discussions on eugenics are obvious. The differences in the capacities of people (and, therefore, in your behavior) can be attributed to inherited differences in your genetic make-up, as well as environmental conditions.

Body and mind follow parallel paths and intertwined in this process of genetic interaction with the environment. In the process, the reality is recognized and analyzed, giving rise to intentional actions, the concepts and meanings, which are responses to the needs and desires of each individual. Space, time, causality, imitation, the playful and other categories play an important role in the process of genetic interaction with the environment.

The reality, initially perceived as the set of facts and natural phenomena and facts and actions, artifacts, accessible to all, is enriched with mentifacts as memories, meanings and representations, generated by the individual and can be retrieved only by the generator. Representations are sensory perceptions, embedded memory and emotions.

This is a cyclical process:

• • • > REALITY > INDIVIDUAL > ACTION > REALITY > • • •

I use an illustrative schema for this cycle, noting that, obviously, the individual is part of reality.

Other individuals are all part of reality and are subjected to the same cycle. Receive information from reality by their individual sensors (senses and memory) and processing this information with their individual processor (brain, mind).

The individual is not alone. Gregarismo is a characteristic of animal species. The fundamental question is how individuals interact? Communication plays a key role in the interaction, in the cognitive actions, leading to the construction of knowledge as a social action, responsible for ideologies, languages, arts, religions, styles and political movements.

For illustrative effect, I will consider individual A and individual B. The respective cyclical processes are:

• • • > REALITY > INDIVIDUAL A > ACTION > REALITY > • • • • • >
REALITY > INDIVIDUAL B > ACTION > REALITY > • •

Individual A and individual B are different, receive different information and process them differently. Consequently, the actions will be different and often conflicting. One of the most important characteristics of the human species is the ability to create complex forms of communication, involving the various senses. Thus, the actions of individual A and individual B, resulting from the same phenomenon or fact, that in general are different and incompatible, can be made compatible and even give rise to a common action. So, they may share concrete actions, such as languages, gestures, dance and many artifacts, and also agree on abstract actions, such as myths, symbols, values and ideologies. This is the substrate of the emergence of **cultures**.

An excellent example from fiction is the movie involving two individuals, a deaf and blind, witnessing a crime. The comedy *See no Evil, Hear no Evil*, by Arthur Hiller (1989), is a plot in which a blind man (Gene Wilder) owns a shop where a deaf (Richard Pryor) goes to make a purchase. In that moment there was a murder and the two were the only witnesses. In the confusion, the blind heard everything and the deaf saw everything. They had no explanation, nor understanding about what happened and run away. Both the police and the criminal begin a hunt of the only "auditory and Visual witnesses". They created a sophisticated communication system to escape and even succeed in clarifying the crime, leading to the arrest of the criminal. A theoretical support for the ideas in this paper goes beyond the objective of this small text.

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