

# Consciousness and Hyletics in Humans, Animals and Machines

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**Abstract** This chapter aims to show that the scientific approach to nature, in particular to animals and human beings, is not sufficient to understand the sense of their organism, because it does not explain the sense of their life. Furthermore for the same reason it is not possible to affirm that the human being is a machine, or that a machine could develop so that it can become like—or sometimes as the same in—a human being. To support this assumption I assume a phenomenological attitude following the analyses proposed by Edmund Husserl and some of his scholars.

## 1 Introduction

Consciousness is a central object of investigation for Modern philosophy. The focus of the philosophical gaze on the human subject is certainly one of the key characteristics of the European Renaissance. One must not forget, however, that philosophy, from its beginnings in ancient Greece, even when it has fixed its attention on nature trying to discover its principles, has not neglected the human subject. From the “I have investigated myself” of Heraclitus to the “Know thyself!” of Socrates to the “Truth resides in the interiority of humans” of Augustine of Hippo to the “I think, therefore I am” of Descartes, it is clear that philosophers are investigating the human being. Hence, if their investigations are to yield results, the human being must understand him- or herself, that is, s/he must know his/her capacities and limits. This kind of knowledge constitutes the kernel of the philosophical problem of consciousness, which articulates itself in numerous ways, but which is also deepened by focused and sustained philosophical inquiry.

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Translated by Antonio Calcagno

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I wish here to discuss a way to approach the question of consciousness that is the result of a long distillation process of western philosophy. I wish to launch a “new” challenge to those positions that ground themselves in the presumed “objectivity” of modern science, in the desire that everything be objective. In other words, these objectivist philosophers call for the disappearance of the subject, ultimately dismissing investigations of the subject as a form of “introspection” that cannot guarantee certainty.<sup>1</sup> This scientific way of thinking or, in other words, this scientist view, currently dominates not only philosophy but all areas of research. We have to remind those philosophers who want to eliminate the role of subject that also some scientists are in search of the subject of investigation and propose a probabilistic interpretation of nature. Thus, we have to ask: Can we give an account of reality, in all of its complexity, solely by following that kind of scientific approach? In fact, we are dealing here with science’s battle against the very intention of western philosophy, that is, science struggles in many cases against a form of knowledge that is based on deep and far-reaching philosophical inquiry. One wonders, however, whether the aforementioned “scientific” view, in all of its various forms, is a preconceived and arbitrary “vision of the world” that is similar to the type of vision that philosophy is accused of defending? Given the presumption of that scientific viewpoint to account for reality as it is, it is necessary to begin to discuss the meaning of science and to do so we have to start from philosophy, which is from the perspective that can give reason for science itself. That is why I assume the phenomenological perspective which always seeks to “begin anew” and it does so by inviting us to participate in the study of its objects.

In order to combat the prejudices of some philosophers and scientists, we need first to discuss the major aspects of phenomenology, always with particular reference to the work of the founder of the phenomenological school, Edmund Husserl. We have to examine the essential elements of phenomenology in order to see how they have developed and how they stand in relation to various scientific views.

I propose that we understand phenomenological inquiry through a metaphor, namely, that of concentric circles, regarding in this case the topic of our inquiry: the human, the animal, and the machine. By employing this metaphor, we will clarify the object of research, the structure of consciousness, and the connections between different phenomenological realms.

In the phenomenological school one sees a great interest in the phenomena of animal and plant life, especially given that an understanding of the human being is arrived at, in part, through an understanding of these phenomena. This interest

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<sup>1</sup>Shaun Gallagher and Dan Zahavi develop interesting positions on this debate in their work *The Phenomenological Mind* (London: Routledge, 2012). Both authors emphasize the importance of the phenomenological perspective, which, in their view, is neither purely psychological nor introspective; rather, they see the phenomenological mind as central to understanding the human being. Even though they acknowledge the contribution of the cognitive sciences and neurosciences, the nature of their work remains largely phenomenological and philosophical.

appears in the work of Hedwig Conrad-Martius and Edith Stein,<sup>2</sup> but it was Husserl who earlier began this kind of research.

At a first approach we can say that the difference between the human being and the animal can be located in an understanding of consciousness, as we will endeavor to show; we also discover in the phenomenological approach to consciousness the difference between human beings and machines. In what follows, I will discuss, first, the phenomenological description of the human being, then of animals and, third, the problem of consciousness and machines.

The leading thread will be the so-called “hyletic dimension”, which permits us to establish the relationship between human beings and animals. Then it is necessary to explain what is “hyletics”.

## 2 The Role of Hyletics in the Description of the Human Being

Through the epoché of the natural attitude—that is the operation of putting into parenthesis all that we already know in order to start anew—that characterizes the philosophical approach according to Husserl, he discovers a new territory inside the human being, that is the territory of the lived experiences (*Erlebnisse*) and we have consciousness of them.<sup>3</sup>

Husserl’s analysis of lived experiences highlights the two-fold nature of their noetic moment—that is the intention to grasp the sense—and their hyletic or material moment. In what follows I will try to explain the meaning of the two aspects.

The term hyletics does not indicate matter in the traditional sense, but a new type of materiality that Husserl proposes in § 85 of the first volume of the *Ideas*.<sup>4</sup> He was looking for a new term and thought he found it in the Greek word *hylé*. It was a question of identifying what had never before been clearly delineated, and for this reason there was also no existing term to describe it. The description of this sphere

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<sup>2</sup>I examined these phenomenologists’ positions in “*Edith Stein’s Contribution to Phenomenology*,” in *Analecta Husserliana*, vol. 80, ed. Anna Teresa Tymieniecka (Dordrecht: Kluwer, 2002), 232–240; “*Edith Stein: Phenomenology, the State and Religious Commitment*”, 648–656; and “*Hedwig Conrad-Martius and the Phenomenology of Nature*”, 210–232.

<sup>3</sup>Regarding the meaning of *epochè* and of the lived experiences I have described it in my book *The Sense of Things. Toward a Phenomenological Realism*, Translated by Antonio Calcagno, “*Analecta Husserliana*,” vol. cxviii, Springer 2015.

<sup>4</sup>Edmund Husserl *Ideen zu einer reinen Phänomenologie und einer phänomenologischen Philosophie*, transcribed by Edith Stein between 1916 and 1918, revised by Ludwig Landgrebe from 1924–25 and by Husserl himself until 1928, and finally edited by Marly Biemel in 1952 as volume IV of *Husserliana*. Volumes I and II of the *Ideen* were edited by Karl Schumann as volumes III-1 and III-2 of *Husserliana*..

is further developed in the second volume of the *Ideas*<sup>5</sup> with the analysis of the living body (*Leib*), which experiences both the localization of bodily sensations [*Empfindnisse*] important for the constitutive function of objects that appear in space and a completely different group of sensations that Husserl calls sensorial sensations [*die sinnlichen Empfindungen*], for example, the sensations of pleasure and pain, of bodily well-being or discomfort deriving from the body being physically unwell.<sup>6</sup>

This line of description continues to be present in a large number of manuscripts, especially the C and D groups of writings from the 1930s. The function of hyletics within the field of the sensations is particularly investigated in Ms. Trans. D 18, which is dedicated to a discussion of the formation of the kinaesthetic system. This system accounts for the relationship between one's own body and the changes of the surrounding world within the framework of the ocular-motor field. In Ms. Trans. D 10 I, Husserl specifies that the kinaesthetic system becomes constituted in relation to the constitution of hyletic objects,<sup>7</sup> but it is in Ms. C 10 that one grasps the connection between hyletic units and affectivity, because even though the hyletic universe is a non-egological universe that becomes constituted without the intervention of the I, "*das Ich ist immer 'dabei'*," the I is always present as the locus of affectivity and it is always active in some fashion.<sup>8</sup>

Let us examine further Husserl's reference to the two groups of localized sensations, which serve as a material similar to that of the primary sensations' intentional *Erlebnisse*, for example, hardness, whiteness etc. These groups of sensations, according to Husserl, are immediately, somatically localized: in every human being, these sensations manifest themselves in an immediate intuitive manner in the lived body (*Leib*) inasmuch as it is the person's "own body," a body that is a subjective objectivity that is different from the experience of the body as a purely material thing extended in space.<sup>9</sup> The experience of one's *own* body, "difficult to analyse and illustrate," is linked up with the sensations of tension and relaxation of energy, in the sensations of internal inhibition, of paralysis, of liberation, which forms the base of the life of desire and will.<sup>10</sup> But connected with this stratum of sensations are "intentional" functions. The material of the aforementioned sensations of ownness assumes a spiritual function much like that of the primary sensations that come to form part of the perceptions on which constitutive judgments become constituted.<sup>11</sup> Hence, stratification occurs on two levels: first, on the level of cognition, formed by primary sensations, perceptions, and perceptive judgments, and,

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<sup>5</sup>*Ideen*, III-2.

<sup>6</sup>*Ibid.* § 39.

<sup>7</sup>Ms. Trans. D 10, *Zur Konstitution der physischen Natur. Zuerst Leib—Aussendung; dann rückführend auf Hyle und Kinästhesie*, 23.

<sup>8</sup>Ms. Trans., C 10, *Das gehört zum Komplex der urtümlichen Gegenwart!*, 25.

<sup>9</sup>See Edmund Husserl, *Ideen* II, §39.

<sup>10</sup>*Ibid.*

<sup>11</sup>*Ibid.*

second, on a psycho-reactive level, formed by sensorial sentiments and valuing. The perceptive, judicative and valuing levels are noetic.

The relationship between hyletics and noetics is thus clearly delineated, but the hyletic moment seems to drag the noetic one behind it, and hence Husserl's peremptory affirmation: "... a man's entire consciousness is in a certain way with his body through its hyletic base".<sup>12</sup> But the duality is not eliminated. Indeed, the intentional *Erlebnisse*, as such, are not localized and do not constitute a stratum of one's body. The autonomy of the intentional moment with respect to the material one is in this way confirmed and corroborated. In fact, inasmuch as it is a tactile grasping of form, perception is neither in the finger that touches nor in the tactile sensations that are localized in the finger. Thought is not really localized intuitively in the head, as are the localized sensations of tension.<sup>13</sup> Husserl notes that we often express ourselves in this way, and one may wonder why we do so. One can reply by saying that the attractive force of the hyletic localization makes us concentrate our attention on our body.

Turning to the discussion of animals, though it is impossible for us to live what animals live, it is possible to perform an act of empathy [*Einfühlung*] that consists in grasping their lives and the acts lived by them insofar as these acts are similar to those lived by us. Recall that what Husserl said about the animal world and instinct was situated within Husserl's discussion (in *Ideas II*) of the human capacities to grasp that world.

There is a level of likeness between humans and animals: we can grasp the bodily sensations and reactions of animals through their psychic acts, especially when we are in contact with more highly evolved animals. The difference and the disparity emerges in the fact that animals cannot perform certain acts that we define as "spiritual," including intellectual comprehension and elaboration, acts of will, and motivated decisions, acts that lie at the very foundation of the construction of the human world. We are aware that we cannot establish empathy at the level of these spiritual acts, and that is why we cannot consider animals to be really "like us." If the aforementioned difference between animals and humans is correct, we cannot fully grasp the mechanism through which animals know the world at a perceptive level. Even if a great variety of modes of cognition exist, especially those researched by ethologists, human perception with its passive processes certainly shares certain similarities with animal perception, but there are also differences as well, especially at the spiritual level. Yet, in terms of psychic reactions, including the embodied, localized sensations and the expressions of satisfaction or disgust, attraction or repulsion, humans and certain animals seem to be quite similar.

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<sup>12</sup>Ibid.

<sup>13</sup>Ibid.

### 3 The Animal and Its Instinctive Life

In Husserl's A, C, and E manuscripts, one finds a treatment of instinct in both the human and animal worlds. That this theme was not tangential in Husserl's reflections is evidenced by the presence of the manuscripts that were eventually to form the second volume of the *Ideas Pertaining to a Pure Phenomenology and a Phenomenological Philosophy*. Here, we find an explicit reference to the psychic constitution of animals vis-à-vis humans.<sup>14</sup> The fact that he later returned to the topic shows that the attention Husserl paid to the animal world was not by any means fleeting; rather, his discussion of animals is important, especially for our purposes here.

In Ms. E III 10, Husserl employs his study of the pre-given world from the viewpoint of impulse and instinct as the starting point for tackling the investigation of knowledge of the human and animal worlds. The text opens with one of the very few passages where Husserl refers to Freud's analyses and seems to share Freud's conclusion: Husserl accepts the possibility of the existence of "repressed" affects, of unsatisfied desires, which are relegated to the level of the unconscious and generate an "illness" of the soul. "Everything that is removed, everything that is of value, but remains hidden, continues to function in an associative and apperceptive manner, something that the Freudian method deems possible and presupposes."<sup>15</sup> Starting from this consideration, Husserl examines the dynamics of the special intentionality that characterizes instincts. The desire for food, for example, can be described by using an approach that is valid for certain modes of cognition but in this case it is linked up not with cognition, but with instinct: there is a tending toward a fulfillment that finds its realization in an object, which, in this case, is the act of eating. In actual fact, hunger helps Husserl to understand the dimension of instinct, for the I is always hungry: hunger is its habitual condition that is only temporarily satisfied or fulfilled by eating food.

The analysis of instinctual life in human beings leads Husserl to establish that, first, it is precisely thanks to habits that the unity of the I already constitutes itself at the level of instinct such that the unity of the subject, though recognized by consciousness, is of a prior origin; second, habits themselves influence and, in some cases, even determine the direction of the will, hence, passivity plays an important role within the sphere of the human will. For example, the need for walking becomes transformed into a decision: "I want to go out." One can also trace what is typical in the fundamental structure of needs that become articulated at different levels and that constitute the structural form of all life, thereby making it possible for the I to possess a systematic structure of its orientations of will. In a broader sense, we can consider the modes of the will and of originary instinctual life to be a *Vorgestalt*, that is, a form that precedes other forms.

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<sup>14</sup>See Sect. 2, Chap. 4, §45.

<sup>15</sup>Edmund Husserl, Ms. Trans. E III 10, *Vorgegebene Welt, Historizität, Trieb, Instinkt*, January 1930, 3.

Husserl examines the “vital” instinct of animals in essential terms and not from the viewpoint of the natural sciences, which study only animals’ physical aspects. Ethologists and animal psychologists, though they seek to penetrate the “inside” of psychic life, do not, according to Husserl, possess adequate instruments for going deeper into what they live. The vital instincts of animals can only be interiorly understood through transcendental phenomenological analysis: “... in this way we have the animal subject as subject of its pregiven world, of its acquired orientations and correlates, a world in which one always finds the same objects.”<sup>16</sup>

Husserl begins his analysis by highlighting two particular instincts, namely, survival, which is linked with food, and that of generation, which is connected with a dimension of togetherness. These two instincts, of course, do not exhaust the description of instinctual life. The instinct of fear, for example, is also of considerable importance for survival. Moreover, pleasure and non-pleasure, attraction and repulsion through the sense of smell or vision are also connected with both the instincts of survival and togetherness.

If instinct is understood as internal, always in the phenomenological transcendental sense, how can a species preserve itself? An animal is born into the world and leaves it because of its natural death due to old age, illness, or as a result of chance events. Is it possible, therefore, to understand what happens in the psyche and consciousness of an animal, a highly evolved animal, of course, when it confronts death? The animal knows death through the deaths of its companions, but does it make sense to speak of companions, family relations, and education? Is there some relation between the I, the You and, therefore, the We of the animal world? Husserl’s answer is affirmative, even though the intersubjective world of animals is characterized by a basic form of relations between males and females, between father, mother, and “offspring,” between friends and enemies, or by the struggle for life or death. But what is the animals’ level of awareness of the very individuality of each animal?

The answer to this question is found in the central part of the manuscript, which bears the subtitle, “*Das Tier und das Wissen von seinem Tode. Höhere Tier und tierische Ich und Wir in Umwelt (Begriff des höheren Tieres)*” [The Animal and the Knowledge of Its Own Death: Higher-Order Animals, the Animal-I and the We in Their Surrounding World: (The Concept of Higher-Order Animals).]<sup>17</sup> Life preserves itself in a continuous development of its own actualizations or growth that begin for the individual at birth and terminate with death, but birth implies also generation, and thus survival of the species, and yet even species come to an end. The examination of the animal world, therefore, requires a comparison with the human world, which ultimately brings out both the similarities and the differences between both the animal and human worlds. And if we can carry out a non-anthropomorphizing comparison, we find that the human spirit is certainly absent in the animal. Nevertheless, we can understand the psychic life of animals

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<sup>16</sup>Ibid., 10.

<sup>17</sup>See pages 12–17 in Ms. Trans. E III 10.

that we are able to understand without projecting onto the animal our own human traits. One may certainly and rightfully ask oneself whether the individual animal has consciousness of its own death, but it would certainly be nonsensical to wonder whether or not the animal is conscious of the end of its species. Yet, this latter concern is present for humans, albeit we find it in different grades of awareness in different people.

Human life is explicitly connected with its own death, but it is also connected with its own human history and, more precisely, with the future of humanity and thus also with the life and death of humanity as such and with the surrounding human world as a cultural world. This is true for the highest levels of development achieved by humanity so far — in this case, once again, there are different real and possible degrees of awareness.<sup>18</sup>

It is clear that we can definitely speak about a hyletic dimension within the animal world, though the awareness of animals' own interiority, of their own consciousness, remains mysterious.

## 4 What Is Consciousness? Consciousness and Machines

If the hyletic dimension is shared by both humans and animals, we have to ask whether or not another, more specific dimension, rich with implications, exists. What is consciousness? Where can we locate it? Does it have a specific place or location?

The mental organizing that leads us to imaginatively locate things in space leads us to find a place for anything, for things that do not require a space, for things that are not spatial. For example, God, the gods who are in the heavens, the devil, the damned at the center of the earth, the ideas of a heavenly world, etc. Spatiality is linked to corporeity or embodiment. This is why space is important for human beings. But not everything in human beings is spatial, especially consciousness. Consciousness is the way in which the human being is aware of what he/she lives, that is of the lived experiences, through which one knows himself as body, as psyche and as spirit, i.e. an intelligent being. Intelligence and will are defined as spiritual, in the sense that they belong to humans and distinguish them from the other beings in nature.

Consciousness is then very important for the us. But to what extent can we recognize that animals and machines have consciousness? And if so, which kind of consciousness?

The special edition of the journal *Paradoxa*<sup>19</sup> dedicated to consciousness can assist us to understand the non-spatiality of consciousness. In this issue, we find examples of contemporary views of consciousness. The articles contained in it deal

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<sup>18</sup>See page 17 in Ms. E III 10.

<sup>19</sup>*Paradoxa, What is Consciousness*, Fondazione Internazionale Nuova Spes, Roma, October–December 2009.

with the “ancient” problem of the relation between the body and the soul, which today is described as the mind-body problem. Three solutions are offered to this problem: a monistic account in which only the body exists; a dualistic account of two different and heterogeneous realities; and a dual account in which there is a stratified and complex unity.

The monistic or physicalist view is more prevalent, not only for those who work directly in the biological sciences but also for those working in psychology. Physicalists will often use the results of the sciences, especially the neurosciences, to justify their positions. Less diffuse is the view advocated by those who distinguish between the natural and human sciences—a view that was widely held until the end of the 19th century by such thinkers as Dilthey, Husserl and Stein in Germany and Henri Bergson in France. The acceptance of the more prevalent view can be seen as a victory for the positivist model. The physicalist or scientific viewpoint can largely be designated by the following traits: a rigid adherence to traditional evolutionary theory, the validity of the neurosciences, and the identification of consciousness with brain activity.

If we examine the articles contained in the aforementioned journal, on one hand we obtain a wide panorama of contemporary views, and on the other hand through the citations within the articles, we encounter various researchers who have opened up or helped develop new fields of research. We also find a divided field of inquiry.

If we focus our attention on what is said about consciousness in the journal, we find recognition, albeit superficial, of what Husserl and phenomenology claimed about consciousness: “Phenomenology is a study of consciousness said to have been founded by the German philosopher Edmund Husserl, who defined it (in 1901) as: “The reflective study of the essence of consciousness as experienced from the first-person point of view.”<sup>20</sup>

We find here an interest in research carried out from the first-person perspective as opposed to inquiry carried out from a third-person perspective, which is largely practiced by the majority of scientists who describe themselves as carrying out “objective” research.

If we admit the viability of the first-person viewpoint, which undoubtedly signals a remarkable methodological turn, one notes the characteristics of consciousness described by the authors of the articles in *ParadoXa*: we find the I, the sense of the I, its identity, free deliberation of the will, and the will. Even if these concepts are considered with reference to the functions of consciousness, we do not find an answer to the question “What is consciousness?” When we do find intimations of what consciousness could be, we find polemical critiques of the Cartesian *cogito* that maintain “that such a spontaneous and approximate “explanation” of the I expressed from a physical, material mechanism in my brain gives to itself other

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<sup>20</sup>Igor Aleksander, “What Computation Can Tell Us About Consciousness,” in *ParadoXa*, *op. cit.*, 77. Igor Aleksander is Emeritus Professor of Neural Systems at Imperial College, London, UK.

physical mechanisms necessary for the performances of the free deliberation of the will, which, again, happen “there” in my (amazingly physical!) brain.”<sup>21</sup>

For those who maintain that the brain must be understood from the perspective of the neurosciences, one finds a functional definition of the brain. Mental processes, especially first-person ones discussed by phenomenology, constitute, in their totality, the mind, and can be employed in Virtual Machine Functionalism, understood as the “state structure of a system.” This is Igor Aleksander’s position, which proposes to construct not real, but virtual machines, for virtualism allows for the possibility of overcoming the difficulty of physicalism (monism) and the mind-body dualism by means of a “flexible” relation between structures and functions.

This argument could also be understood in terms of the identification of the brain with a neuronal machine. Naturally, given that the machine is not a living organism, it has no relation to the sense of the hyletic discussed above, but it certainly is related to consciousness. According to this hypothesis, if the brain possesses a neural network, it becomes possible, then, to construct conscious machines or thinking robots. This thesis is maintained by Domenico Parisi, who argues that if we wish to understand what consciousness is, we must be capable of building robots that have a mental life.<sup>22</sup> The construction of robots, which are seen to be different to living organisms, allows one to reproduce the different phenomena of consciousness that would allow us to understand the very nature of consciousness itself.

Aleksander does not accept the foregoing thesis and moves the discussion of machines to the virtual plain, but he also wishes to understand what consciousness is through “computational machines.” The problem, however, remains: What is the relation between the brain (organism) and the machine (real or virtual)? In both cases, do we still not find ourselves lapsing into mechanism? We have to admit, then, that what is new with respect to the mechanistic model is the first-person perspective and the ability to examine whether or not the things of the mind are independent of the brain, as Aleksander maintains. He ultimately wishes to uphold the “comparison” between virtual machines and the brain. This is also confirmed in the essay by Lorenzo Magnani when he affirms, “Computers possess, for example, developed decisional capacities (even though now they do not have programs and structures that allow them to experience the conscious sensation of the will and the deliberation of the will).”<sup>23</sup>

Even if we admit that it is true, can we conclude that the human being is like a machine?

At this point, Martin Heidegger’s objection concerning technology arises: Can technology explain the structures of human beings? Can technology do likewise for

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<sup>21</sup>Lorenzo Magnani, “*L’evoluzione della coscienza e del libero arbitrio*,” in *ParadoXa*, op. cit., 51. Lorenzo Magnani is Professor of the Philosophy of Science at the University of Pavia.

<sup>22</sup>Domenico Parisi, “*Robot che “hanno la coscienza”*,” in *ParadoXa*, 62..

<sup>23</sup>Lorenzo Magnani, *L’evoluzione della coscienza e del libero arbitrio*, op. cit., 56.

other living organisms? This is also Heidegger's question is more complicate than the one posed by evolutionary theory, which maintains that consciousness is the product of evolution. In this case, biological processes of organisms are separated from the processes of artificially constructed machines (virtual or real). On the contrary, the tendency of contemporary biological studies, which we referred to above, is to link consciousness with the brain and to almost exclusively focus their scientific investigation on the brain, ultimately reducing it to a machine; even if a machine could be a highly complex system, it is not an organism. In fact the complexity cannot reach the qualitative level of an organism.

Not all researchers working in the aforementioned fields are reductionists. Tito Arecchi, for example, rejects the thesis of the so-called "eliminativists," who maintain that "every act is determined by the initial conditions of our atoms and molecules; we are automatons."<sup>24</sup> Critical of those who uphold the Strong Artificial Intelligence [*Intelligenza Artificiale Forte*] position, Arecchi argues that the adaptability of organisms—here, we see a strong connection with evolutionism—exceeds "the power of an algorithm that we can install in a computer."<sup>25</sup> We can admit that the DNA of an organism could be explained through an algorithm but its own structure or sense is more than an algorithm, it is life.

The picture that Arecchi paints of the evolutionary process permits us to overcome absolute determinism, thereby introducing adaptive, non-algorithmic leaps that exceed efficient causality and that allow for final causality. His argument is based on Gödel's incompleteness theorem. Hence, Arecchi is able to account for "leaps outside of a particular species," which lie outside the realm of algorithmic processes and which are based on "other enunciations that are compatible with axioms, but which are not demonstrable by a pre-selected algorithm."<sup>26</sup>

According to Arecchi, his thesis allows us to understand how mammals and birds replaced dinosaurs. His theory is very similar to that of the phenomenologist Hedwig Conrad-Martius, who posed the same question of the transition of early sauria into mammals. In order to justify this transition, she introduced her theory of qualitative leaps.<sup>27</sup>

The theories of Arecchi and Conrad-Martius highlight the insufficiency of a purely "scientific" approach, understood in the abovementioned sense, in order to understand nature. Both thinkers introduce a qualitative element into the discussion because they are convinced of the necessity for both biology and physics to be open to metaphysics. Is the insufficiency born from the practice of science itself or does science already contain such an insufficiency within itself? In part, science is concerned with truth and requires the obtainment of what is "most true." It also

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<sup>24</sup>Tito Arecchi, "Fenomenologia della coscienza: complessità e creatività," in *ParadoXa*, *op. cit.*, 38.

<sup>25</sup>Ibid.

<sup>26</sup>Ibid., 39.

<sup>27</sup>Hedwig Conrad-Martius, *Ursprung und Aufbau des lebendiges Kosmos* (Salzburg-Leipzig: Otto Müller, 1938).

needs to present truths that are coherent with their presuppositions. But are these presuppositions true? Can we even avoid the radical nature of the foregoing question?

Psychological and psychiatric studies note the opposition between those who follow a naturalist, organicist view and those who wish to examine the mental phenomena of the mind, albeit from a different perspective. The latter do not reduce mental phenomena to brain function. One can think here of psychoanalysis or phenomenological psychopathology.

An example of the first type of view can be found in the research of scholars and scientists who draw upon anatomy, neurology, and cognitive and experimental psychology. They examine psychic disturbances as based on neuronal activity. Through advanced technologies, including positron emission tomography, scientists can establish the difference between a vegetative state or state of minimal consciousness and states of awareness or wakefulness. Even functional magnetic resonance imaging applied to “resting cases,” that is to subjects who are in a state of rest, can demonstrate the existence of functional networks important for researchers, including the “intrinsic self-reference of thought” and “conscious access to external stimuli.” Both of these can, “in other words, “embody” the difference between “awareness of oneself” and the “surrounding environment.”<sup>28</sup>

The term “embodiment” is particularly significant. Are these researchers looking for a substrate, base, source or even a locus in which the traditional, specific activities of human beings are grounded? Substrate, base, and locus are not equivocal terms. To affirm that consciousness is based in brain activity is different to saying that the brain is the locus of consciousness or is consciousness. The problem lies in the very functions of the “base.” Certainly, without a brain the human being cannot live and cannot even be called a human being. But what is the brain the base of? So-called higher-order activities are only one manifestation of its functions. But is this function of the brain activated by something else, as was mentioned earlier?

The question of monism and dualism come to the fore again, but it is the third possibility that appears to be important as well, a view we termed dual. The dualist view, which inevitably leads to Platonism, maintains that body (lower-order activity) and soul (higher-order activity) stem from two different sources. The high-order activity is characteristic of human beings and distinguishes them from other animals that do not possess the same capacities of cognition, elaboration, and transformation as human beings. It is precisely because body and soul are qualitatively different that their interaction is only temporary and not posited before us.

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<sup>28</sup>See *I disturbi degli stati di coscienza*, in *Paradoxa*, *op. cit.*, 115. It is interesting to note that the text cited here stems from the collective work of various authors: Andrea Bosco (Researcher in Experimental Psychology), Giulio Pancioni (Professor of Psychology), Marta Olivetti Belardinelli (Lecturer of Cognitive Psychology), Michele Papa (Professor of Human Anatomy), Mario Stanziano, Andrea Soddu, and Quentin Noirhomme (researchers at the Hospital of Liège) work with Papa. Working also at the Hospital of Liège is Steven Laureys (Professor of Neurology).

Hence, this is why it is possible to speak of the experience of the liberation from one's "body."

The traditional conception of the relation between body and soul has resulted in a completely different anthropology than the one advanced by science. The human being was created by God as a unified being that derives from a unique source; God wished the human being to be unified in all of his or her complexity and stratification while still possessing distinct and differentiated aspects that are both true and necessary. Western medieval philosophy has closely focused on investigating the unity of the human being and it could not ignore the insight of the revelation that came from theology, whose concepts were mined in order to gather indubitable "evidence." In order to have viable evidence, what was affirmed as true had to be irrefutably true. Hence, we can understand the articulation of criteria designed to guarantee the validity of knowledge, which were always present but which were most explicitly theorized by both Descartes and Husserl: evidence was seen as veridicality. It is *evident* that the human being is stratified and complex.

Descartes argued that the body is part of nature, which, in his age, began to be understood through the lens of a mathematically informed mechanistic science. Husserl was more prudent, for he conceived of nature in terms of causality, understood in qualitative, non-mathematical terms, a causality that was teleological and neither quantitative nor mechanistic. Certainly, the natural sciences arose because they made evident such causality, but is such an interpretation of nature sufficient to account for nature itself?

Of all of Edmund Husserl's students, Edith Stein maintains, in a less problematic way than did Husserl, that nature can be understood in terms of causality and, therefore, is capable of being understood by the sciences. Other sciences, however, can be employed to understand the human being, including physiology and anatomy, for example. The results obtained from such sciences can be valid, even though they may not be complete. Following Husserl, Stein argues that one finds in human beings both psyche and spirit. In the former, one finds causality, albeit not necessarily in the same form advocated by the natural sciences. In the latter, one finds the acts of the intellect and the will, which are inscribed within a framework of "motivation."<sup>29</sup>

Phenomenology maintains the view that the scientific reading of nature does not complete or exhaust our understanding of nature. A philosophy of nature is always required in order to describe the qualitative elements and aspects of nature. Hedwig Conrad-Martius, who knew the mathematics, physics and biology of her day, affirms the trans-physical elements of nature, which ultimately allow her to offer not only a quantitative understanding of nature but also a qualitative one.<sup>30</sup>

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<sup>29</sup>Edith Stein, *Der Aufbau der menschlichen Person*, in *Edith Stein Gesamtausgabe*, vol. 14 (Freiburg: Herder 2004).

<sup>30</sup>Hedwig Conrad-Martius, *Naturwissenschaftlich Metaphysische Perspektiven* (Heidelberg: F. H. Kerle Verlag, 1949).

Today, a position akin to that of Hedwig Conrad-Martius seems to be impossible. An opening, however, has appeared within the neurosciences. The quantitative and the qualitative encounter one another in the relation between brain and mind. Is it possible to overturn the localizing of consciousness as an epiphenomenon of the brain? I believe this is possible: the brain is only the instrument of consciousness, and this claim is justified through the very complexity and stratification of the human being.<sup>31</sup> In the end, we do not have a dualism, but a duality in which an autonomous psycho-spiritual element is present. This aspect is not verifiable in strictly empirical terms through the use of machines; rather, such verification is the work of qualitative research.

## 5 Conclusion

I can conclude underscoring the difference between an organism and a machine. In order to grasp their difference it is necessary to reflect on the meaning of “life”. We find life when an organism develops itself from inside and potentially can generate other organisms. Machines must be constructed by human beings in an artificial way and even if they reach a great complexity, they are not living beings. It is true that we can produce, using what nature offers to us, something that is more and more similar to us, but this production is not “generation” that is life transmission.

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<sup>31</sup>This position could be considered as the same as classical functionalism, but it is different from it as far as it is based on a complex anthropology. Consciousness can show itself as a function, but it refers to psychic and spiritual aspects of the human being ultimately opening the way to a metaphysical analysis of it..