



Phenomenology and the Digital World: Problems and Perspectives

Silvano Tagliagambe¹

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Abstract

The last years' achievements in neuroscience are key for a philosophical analysis focused on the mind-body problem, such as the phenomenological approach.

The digital evolution, on the one hand, faces us with the interaction between the world of reality and the world of possibility. This means more than a mere coexistence between these two dimensions. Rather, a concrete feedback occurs among them, and this brings out unprecedented and unavoidable issues with regard to perceptual processes. On the other hand, the digital evolution allows for analyzing data and monitoring environmental systems, thus reasoning in a predictive way, anticipating problems, and checking *ex ante* their evolution and outcomes.

Neuroscience, for its part, with the experiments of Libet and their subsequent interpretations, has highlighted a *consciousness of the unconscious* made of ballistic and automatic processes, which constitutes the starting phase of our decisions and actions. This further confirmed that sequential and linear thinking is unable to address the brain-environment relationship that is key in understanding any cognitive process.

This analysis confirms the relevance of different aspects of Husserl's phenomenology. There is, however, a “but,” which significantly reduces the extent of adherence to his point of view. Husserl assumed that an implicit horizon precedes or accompanies the acts of conscience. This is the material, impressional, passive, receptive, and, in some way, tacit dimension, strictly connected to the issue of genesis, i.e. the process of constitution of the analyzed entities. Thus, he drew a clear dividing line between this dimension and the phases of the self-controlling, vigilant conscience and its activity. In fact, his approach to the phenomenological problem is mainly oriented toward these phases.

Keywords Anoetic consciousness · Noetic consciousness · Auto-noetic consciousness · Intentionality · Corporeality · Cognitions · Emotions

✉ Silvano Tagliagambe
sil.tagliagambe@gmail.com

¹ Università di Sassari, Sassari, Italy

1 Phenomenology in the face of neuroscience

The most recent achievements in both neuroscience and digital technology are key to approach the mind-body problem philosophically, as phenomenology has done. Accordingly, we will examine and compare various aspects of this issue with such results.

First, let me emphasize the following: Husserl considers the possibility and incidence of the philosophical and reflective attitude as unproblematic. He hinges on the idea that consciousness can control the variegated constellation of experiences. Such a perspective calls for a double level and considers:

- the primary consciousness of the experience flux (*noetic* consciousness), and.
- the secondary consciousness, which reflects on those experiences, making them the subject of phenomenological thematization (*autonoetic* consciousness).

The noetic structure of consciousness presupposes the principle that “every act is a representation or is based on a representation.” Therefore, consciousness is defined as intentional, i.e. it has the intrinsic ability to orient and direct itself toward something “other” than itself. In this regard, however, two clarifications are necessary:

- First, intentional consciousness is, in any case, independent of the existence of the objects at which it aims. In fact, consciousness can both *imagine* and *perceive* entities that do not exist, as it happens in hallucinations.
- Second, the intentionality of consciousness does not necessarily imply that *all* its states are intentional. This marks a significant difference between Brentano, who excluded the possibility of unintentional states of consciousness, and Husserl, who instead admitted them.

In support of the Husserlian belief, we can refer to the concept of angst. Kierkegaard considered it the very structure of human existence. According to the Danish philosopher, angst emotionally and existentially connotes the weightiest of all categories, i.e. possibility. Possibility is intertwined with human freedom and the necessity to always make a choice. In fact, a human being is unable to remain in a state of limitless indeterminacy, and this fact entails risks. Precisely because linking to the sense of possibility, angst does not address a specific object. Indeed, this lack characterizes our inquietude in the face of unconditional freedom, which feels disproportionate to our finiteness. Experiences like this call into question the problematic nature of our relationship with the infinite and the indeterminate. We can call them unintentional precisely because they lack that openness to the world that characterizes consciousness. Consciousness closes in on itself, as it does in the face of depression. In both cases, we must refer to *feeling*, i.e. a sensorial, material, and passive dimension of consciousness. This face of consciousness deeply differs from the active, explicit, functional, in a word—representational side of *noesis* and *autonoesis*.

Such a relevant limitation of the extension and the absolute primacy of intentionality is a kind of opacity of consciousness, determined by its inextricable connection with corporeality, with a sensorial body. Two components merge here: the immaterial flow of experiences with no beginning and no end, and a body where this flow inextricably occurs. Husserl stressed that the unity of a human being encompasses both components—not as realities

externally linked to each other but as two intimately connected and somehow interpenetrating entities. The world in its fullness is, at once, physical and psychophysical. “It must – who can deny it? – include all the streams of consciousness connected with animated organisms. Thus, on *the one hand consciousness is said to be the absolute* in which everything transcendent, and, therefore, ultimately the whole psychophysical world, becomes constituted; and, on *the other hand*, consciousness is said to be a *subordinate real event within that world*” (Husserl, 1983, p. 124). The doctrine of categories cannot elude traditional Cartesian dualism since it “must start entirely from this most radical of all ontological distinctions: being *as consciousness* and being as something which becomes ‘manifested’ in consciousness, ‘transcendent’ being” (Husserl, 1983, p. 171). Heidegger highlighted the direct Cartesian filiation of this approach. Quoting this passage, he commented that consciousness is conceived as “*res cogitans*” and, when he referred to being as announcing itself in explicit consciousness, “*res extensa*.” He then concluded: “Husserl continually refers to this distinction and precisely in the form in which Descartes expressed it: *res cogitans – res extensa*” (Heidegger, 1983, p. 125).

In turn, Husserl specified that the content of these two levels are “both called ‘existent’ and ‘object,’ and have, more particularly, their objective determining contents. But it is evident that what is called ‘an object’ and ‘an objective determination’ in the one case, and what is called by the same name in the other case, are called so only with reference to the empty logical categories. In so far as their respective senses are concerned, a veritable abyss yawns between consciousness and reality” (Husserl, 1983, p. 111). In fact, there could not be greater distance between the two poles.

Consciousness, considered in its “purity”, must be held to be a *self-contained complex of being*, a complex of *absolute being* into which nothing can penetrate and out of which nothing can slip, to which nothing is spatiotemporally complex, which cannot be affected by any physical thing and cannot exercise causation upon any physical thing — it being presupposed that causality has the normal sense of causality pertaining to Nature as a relationship of dependence between realities.

On the other hand, the whole *spatiotemporal world*, which includes human being and the human Ego as subordinate single realities is, *according to its sense, a merely intentional being*, thus one has the merely secondary sense of a being *for a consciousness*. It is a being posited by consciousness and its experiences which, of essential necessity, can be determined and intuited only as something identical belonging to motivated multiplicities of appearances: *beyond that it is nothing* (Husserl, 1983, p. 112).

The terms of such a relationship are therefore clear:

Over against the positing of the world, which is a “contingent” positing, there stand then the positing of my pure Ego and Ego-life which is a “necessary”, absolutely indubitable positing. Anything physical which is given “in person” can be non-existent; no mental process which is given “in person” can be non-existent. This is the eidetic law defining this necessity and that contingency (Husserl, 1983, pp. 102–103).

This means that for Husserl, the Cartesian relationship between *res cogitans* and *res extensa* cannot be assimilated to the generic relationship between psyche and matter. Indeed, this

relates to the fact that no consciousness can occur nor be objectively experienced if not as the animating factor of an objective living body—yet always *a posteriori* and in a material living body. Accordingly, the mind-body problem splits into two distinct problems:

- the naturalistic problem of the relationship between consciousness and material body, and.
- the problem of the relationship between consciousness and body meant as a living consciousness. This second relationship constitutes the essential bond, which gives rise to the embodied self, to the living body. This is the object of phenomenology.

Thus, the notion of body unfolds into two: a purely material sentient dimension, essentially passive and receptive, immersed in the perceptive world, and an incarnate body pattern whose tasks are functional and constitutive. Husserl focused on the former while considering passive syntheses and temporality in the following writings: *Erfahrung und Urteil* (Husserl, 1948), *Analysen zur Passiven Synthesis* (Husserl, 1966), and *Zur Phänomenologie der Intersubjektivität* (Husserl, 1973). These texts offer a wide range of topics on the affective and pre-reflexive foundation of experience. Husserl proposed a double split:

- On the one hand, we have the mental, with its double cognitive and phenomenal—as well as intellectual and sensitive—components.
- On the other hand, we have the body with its double functional and structural—as well as content and material—components.

The author, here, highlighted the non-intentional status of those experiences that call into question our relation to infinity and indeterminacy, which imply possibility and therefore produce anxiety. This is relevant for our argument, since the digital world precisely relates to these kinds of experiences and emphasizes their importance and diffusion.

In order to highlight this aspect, one may refer to Douglas Hofstadter. This author has shown the extraordinary and unprecedented “Strange Loop” phenomenon that “occurs whenever, by moving upwards (or downwards) through the levels of some hierarchical system, we unexpectedly find ourselves right back where we started” (Hofstadter, 1979, p. 18). First Bach, then Gödel and Escher, by virtue of the explosive creativity of their interpretative work, showed all the potentialities of this “hooking” between the two components that articulate every Strange Loop. For instance, Escher proposed drawings in which

one single theme can appear on different levels of reality. For instance, one level in a drawing might clearly be recognizable as representing fantasy or imagination; another level would be recognizable as reality. These two levels might be the only explicitly portrayed levels. But the mere presence of these two levels invites the viewer to look upon himself as part of yet another level; and by taking that step, the viewer cannot help getting caught up in Escher’s implied chain of levels, in which, for any one level, there is always another level above it of greater “reality”, and likewise, there is always a level below, “more imaginary” than it is. This can be mind-boggling in itself. However, what happens if the chain of levels is not linear, but forms a loop? What is real, then, and what is fantasy? The genius of Escher was that he could not only concoct, but actually portray, dozens of half-real, half-mythical worlds, worlds filled with Strange Loops, which he seems to be inviting his viewers to enter (Hofstadter, 1979, p. 23).

Escher devised and “figuratively realized” those situations, which were described so incisively and effectively by Hofstadter. Today we are able to not only carry them out but also experience them through digital immersion. This provides us with a world of networks and tridimensional virtual environments that an unlimited number of users can experience synchronically and continuously by inhabiting it.

The Metaverse has emerged as a hot discussion topic. It is not, as many believe, an expedient to escape reality and seek shelter in a private dream. Rather, it is a *space of interaction* between any physical and digital environment. A seamless bidirectional stream of data generates a necessary connection between the two dimensions that are constantly connected through this stream of mutual information. This makes one the twin of the other, hence their definition of “digital twins.” It allows for activating data analysis and for monitoring systems in the real world to facilitate predictive mode thinking. We can thus face problems before they even occur, as well as control their evolution and outcomes *ex ante*. The Metaverse involves an interactive relation between a world of reality and a world of possibility. It fully instantiates an interactive relation between a sense of reality and a sense of possibility so that these two dimensions do not just coexist but interact according to Hofstadter’s Strange Loop. Reality and virtuality are no longer opposite, alternative, and serial, as in a linear chain. Rather, they are mutually retroactive, cooperative, and augmentative. The expression “augmented reality” substitutes “virtual reality” based on this augmentative retroaction between the sense of possibility and the sense of reality.

This “augmentation,” which faces issues of unavoidable perceptual processes, is far from being futuristic. It is tangible and available right “here” and right “now,” as a number of ongoing projects show. The simulation of the human cardiovascular system, known as the virtual heart, is among them. World-renowned Italian mathematician, Alfio Quarteroni, is leading this project with his research group at the Politecnico di Milano, thanks to an Advanced Grant of EUR 2,350,000 over five years from the European Research Council (ERC). As he puts it:

Mathematical models also apply to life sciences. Simulation of the human cardiovascular system demonstrates extraordinary success in understanding what happens to our heart and arteries where devastating pathologies may occur or originate. Fatalities caused by cardio-circulatory diseases constitute more than a third of all the natural diseases in the Western world. Mathematical models based on the laws of physics that regulate the blood flow in the arteries or the heart’s ventricles, along with the laws underlying the deformation of arterial walls or cardiac chambers (atria and ventricles), may determine a turning point for *personalized* cardiovascular medicine. In fact, for instance, they may predict the result of therapeutic or surgical operations on a specific patient. Parameters carry physical significance in these models. They are connected through physical laws and can be adapted to the changing conditions of patients (Quarteroni, 2021, pp. 32–34, my translation).

The same kind of approach may apply to analyzing not only people but also the environment. A thorough and precise investigation of environmental alterations and degenerations allows for finding possible solutions. The research is ongoing: Virtual Singapore, the digital twin of the city-state, combines data from maps, plans, photographs, citizens, and a wide range of sensors, thus offering a shared space for the various interested parts of the city to cooperate on current challenges and plan future opportunities. On the other hand, the European Union has announced the Destination Earth project. The goal is to make Earth’s digital twin, thus gathering several twins: one created to monitor and control extreme climatic

events; one elaborated to test climate change adaptation policies, and other virtual simulations focused on specific aspects or environments, such as the digital twin of the oceans and the Arctic. Hopefully, such a digital reproduction of our planet will be as complete as possible.

The digital makes such developments available. This involves not only a certain kind of technology and its applications but also a specific and revolutionary style of perception and thought. Moreover, it is an unprecedented experience. As the aforementioned discussion on the Metaverse shows, Husserl can offer both productive and less positive contributions to the subject. As referenced, his idea of intentional consciousness is valuable because Husserl sees consciousness as independent from the existence of the object it addresses. In fact, it can either *imagine* or *perceive* non-existing entities. In this respect, his discourse may relate, without forcing it, to Kant's crucial distinction between reproductive and productive functions of imagination. In fact, imagination is one of Kant's key topics as it concerns the question of the "application of the categories to objects of the senses in general" (Kant, 1998, p. 256):

Imagination is the faculty for representing an object even without its presence in intuition. Now since all of our intuition is sensible, the imagination, on account of the subjective condition under which alone it can give a corresponding intuition to the concepts of understanding, belongs to sensibility; but insofar as its synthesis is still an exercise of spontaneity, which is determining and not, like sense, merely determinable, and can thus determine the form of sense *a priori* in accordance with the unity of apperception, the imagination is to this extent a faculty for determining the sensibility *a priori*, and its synthesis of intuitions, in accordance with the categories, must be the transcendental synthesis of the imagination, which is an effect of the understanding on sensibility and its first application (and at the same time the ground of all others) to objects of the intuition that is possible for us. As figurative, it is distinct from the intellectual synthesis without any imagination merely through the understanding. Now insofar as the imagination is spontaneity, I also occasionally call it the productive imagination, and thereby distinguish from the reproductive imagination, whose synthesis is subject solely to empirical laws, namely those of association, and that therefore contributes nothing to the explanation of the possibility of cognition *a priori* (Kant, 1998, pp. 256–257).

Here, a problem on the relation between perception and imagination arises. This concerns not only an issue of the history of philosophy but also the interpretation of the Kantian perspective and its outcomes. As pointed out by Gallese and Guerra, "a recent research study using high-density EEG has shown that the cerebral circuits that inhibit an action being performed and those that actually block the performance when we really only want to imagine it are partly the same" (Gallese & Guerra, 2020, p. 40).

Husserl's approach is less effective when he places an "abyss" (as mentioned, this term was used by Husserl himself) between consciousness and reality. He considered consciousness as a "*self-contained complex of being*, a complex of *absolute being* into which nothing can penetrate and out of which nothing can slip, to which nothing is spatiotemporally external and which cannot be within any spatiotemporally complex" (Husserl, 1983, p. 112). Such an unbridgeable distance, which implies the impossibility of the relationship, is unconceivable in light of the digital world. In fact, this postulates the constant convergence, the linking, and the interaction between various levels of the matters to which it applies. For example, it relates data and metadata; the translation (horizontal logic) of information into

information (horizontal logic) and the production of information from information (vertical logic), and theory and practice, as well as the inside and the outside, which are never antithetical and extraneous to each other.

This is not a matter of mere terminology: the digital world is a unifying tension and, as a place of convergence and a state of relationship, has a relational propensity. This contradicts the idea of dimensions and aspects that are resistant to such a building of connections and relationships. If reality as such remains in the background, if there is no way to bring it back into the orbit of the “complex closed in on itself,” i.e. consciousness, if it is a pure “outside” and a hereafter, then it becomes an unanswered question that cannot even be asked. This is the classic, central question placed by Althusser in what is possibly his most lucid essay: the 1965 introduction to the Italian edition of *Lire le capital* (Althusser, 1971). Here he noted:

A fact intrinsic to the very existence of science is that science cannot pose problems but on the ground and within the horizon of a defined theoretical structure (its problem), which constitutes the condition of an absolute definite possibility and therefore the absolute determination of the *forms of each problem emerging* throughout the steps considered by science (Althusser, 1971, p. 26, my translation).

Accordingly,

the same relationship that defines the visible also defines the invisible as its own inverse shadow. The field of the problem defines and structures the invisible as a defined excluded. It is *excluded* from the field of visibility, and *defined* as excluded through the existence and the specific structure of the field of the problem because it prevents and removes the reflection of the field on its subject—in other words, the necessary and immanent connection of the problem to one of its objects (Althusser, 1971, p. 26, my translation).

Therefore, the invisible is not external and alien to the field of the visible. It rather corresponds to the incapability of the theoretical problem to see its own subjects:

the invisible is defined by the visible as its *own* invisible, *its own* prohibition to see. Therefore, the invisible is not simply—to take up the spatial metaphor—the “*outside*” of the visible, the external darkness of exclusion. Rather, it is the *internal darkness of exclusion, which is internal* to the visible itself because it is defined by the structure of the visible (Althusser, 1971, p. 27, my translation).

Hence, we have two spaces, the visible and the invisible. Yet they are in such a relationship that the second is included in the first one—and this contains the second as its own negation. This is because the invisible is nothing more than the result of the negation of what the visible, within its limits, excludes.

This discourse about the relationship between the visible and the invisible also apply, without forcing, to the relationship between the inside and the outside, as theorized by Husserl. Asserting that reality is totally outside and detached from consciousness, beyond an unbridgeable abyss, inert in the background, unable to affect the consciousness, which would be totally impermeable to its stimuli, means settling on an oppositional polarity of

“inside” and “outside.” Now, scientific research has questioned this in all its articulations. Biology, for example, is increasingly deepening the relationships between the body and its environment. It has highlighted the porousness of the boundaries between the various organisms. The skin, which is our border, does not act so much as a line of demarcation between the inside and the outside. It rather plays a role in the incessant exchange between us and what we imagine and place outside ourselves. We are discovering that the latter, in reality, is inside our body, like bacteria and other microorganisms of various types. Also, if we assume the inside-outside antithesis, then we cannot even grasp the definition of landscape as adopted by the European Convention in Florence in 2000. This is “a certain part of *territory*, as it is *perceived* by the populations,” i.e. the fruit of an inseparable link between the physical environment and the inner world.

Accordingly, we must rethink the main categories at the foundation of our style of thought. We should take lessons such as that of Jean-Luc Nancy (1999) seriously. Nancy moved from the assumption that there is no singular being without another singular being and:

that the self, whatever “I,” in its constitution and for the formation and development of its personal identity depends on the other. Hence, inter-subjectivity is the basis of subjectivity, and not vice versa. “I am ‘I’ (I exist) only if I can say ‘we.’ This also applies to the Cartesian *ego*. Descartes considered it a common—the most common—certainty, but we only share it, in every moment, as another... (Nancy, 1999, p. 258, my translation).

This implicitly suggests translating the traditional “*Cogito, ergo sum*” into “*Cogito ergo cum*,” committing to deepen the nature and meaning of the preposition “*cum*,” meaning “together with.”

2 Phenomenology facing neuroscience

Let us start this comparison by referring to the relevant conclusions of the American neurophysiologist and psychologist Benjamin Libet. His famous 1977 experiment aimed at establishing the exact moment in which an action becomes aware. Even the title of the work by Benjamin Libet and collaborators, published in 1983 in the respected journal, *Brain* (Libet et al., 1983, p. 106), was rather provocative. Particularly its subtitle, “The Unconscious Initiation of a Freely Voluntary Act,” sounded paradoxical: how can a voluntary act occur unconsciously? Well, it can because although it seems so; the act is by no means voluntary. Let us try to understand how Libet came to this conclusion.

In the experiment, the subjects sat in front of a screen where a point moved in a circular trajectory, like a hand on the dial of a clock. They were asked to perform a simple movement, such as twisting a wrist or bending a finger whenever they felt like doing so. Their only task was to communicate the position of the rotating point when they realized that they were going to move their wrist. That moment corresponded to the moment in which they were aware of wanting to make the gesture. At the same time, however, a series of electrodes placed on their heads gauged the moment when the *Readiness Potential* (RP) preced-

ing the action was generated, i.e. the electrodes detected the potential change that preceded a movement. This is also known as *Motor Readiness Potential* (MRP).

The results of the test showed that the volition process (MRP) begins 550 ms before the action. This surprising result demonstrated that awareness begins on average only 200 ms before action, meaning our will starts before we realize it. How else can one explain this 350 ms gap between the subjective time of the decision and the neural time? The conclusion drawn by the authors of the experiment was that “the brain decides” to start the movement before the subject is aware of having done so, thus questioning the existence of free will.

For example, when you choose to make a click, you become aware that you are touching the mouse simultaneously with the decision to perform that action. Yet, things are not so simple: it takes a relatively long time (about half a second) for the brain to become aware of the event. How is it possible, then, that we feel we are touching at the same time we decide to do it, instead of half a second later?

“This brings up us to an important general question about can different stimuli that are actually delivered simultaneously can be consciously perceived as being synchronous” (Libet, 2004, p. 68). Evidently, a brain mechanism delays the actual awareness of an event to make it coincide with the event itself. In other words,

if awareness of all sensory stimuli is delayed by about 0.5 s (...), then *our awareness of our sensory world is substantially delayed* from its actual occurrence. What we become aware of has already happened about 0.5 s earlier. We are not conscious of the actual moment of the present. We are always a little late (Libet, 2004, p. 70).

This half-second gap makes consciousness possible. If lacking, then we would not have time to interpret, modulate, or inhibit the immediate sensations that we perceive. We would, therefore, be slaves to events. In fact, if the stimulation lasts less than half a second, then nothing is felt. This is the duration that the cerebral cortex needs in order to process a conscious stimulus. Thus, according to Libet, “we should have to modify the existential view of living in the experience of the ‘now’; our experience of the ‘now’ is always delayed or late” (Libet, 2004, p. 72).

This demolishes the apparent simultaneity of the sensory experience and the consciousness of an event. It follows that what we call “the present” is actually always “*the remembered*,” as Edelman (1989) pointed out. There, he emphasized that our consciousness does not exist in the immediacy of the happening: it appears and operates with a delay that the author quantifies from 1/10 of a second up to a second, which is even more than what Libet had found. This is why, for example, the activation of the acoustic areas of an athlete at the starting blocks is unconscious and anticipates his awareness. Indeed, that is enough to activate the motor areas. The remembered present is a form of primary consciousness. It presupposes a temporal model of the “self” and of the world, linked to a model of symbolic language or, at least, some non-human primate conceptual skills.

Further experiments followed in Libet’s footsteps. Although their conclusions remained substantially unchanged, they were still able to deepen his research. The original interpretation of these results either denied or at least substantially reduced the possibility of referring to free will. However, a less drastic reading has gradually emerged from Étienne Klein’s objection in principle. It reads as follows: “All these alleged definitions of time are in reality only images, tautologies, metaphors, and paraphrases because all presuppose [...] the

idea of time” (Klein, 2003, p. 15, my translation). Then, in 2012, a paper by Schurger et al., (2012) offered an alternative interpretation of the “readiness potential” as prior to the movement. It differed from the long-established interpretation of Libet’s work. The study suggested that the apparent accumulation of this activity, up to 200 ms before the movement, could reflect the flow and reflow of the background neural noise rather than the result of a specific neural event corresponding to a “decision to initiate movement.” The whole issue resumes through a recent contribution by Richard Anderson’s group (Affalo et al., 2022). The authors claim that the “pre-urge to move” neural activity is contingent on a previous choice, even though it belongs to a higher level than the choice to initiate a single movement. In this way, they also challenge the negation of agency that Libet had drawn based on his own interpretation of his experimental outcomes.

To better understand and appreciate this observation, let us refer to the articulation of consciousness proposed by Tulving (2002). This author started from an unconscious level, and proposed a subdivision of consciousness into three forms, namely the *noetic* form (thought-mediated types of consciousness linked to perception and exteroceptive cognition); the *autonoetic* form, as indicated by Husserl (abstract types of perceptions and cognitions that allow conscious “awareness” and reflection on the experience in the “eye of the mind” through episodic memories and fantasies), and the *anoetic* form, which Tulving defined as forms of a non-reflective experience that can be emotionally intense without being “known.” This could be characteristic of all mammals.

Implicitly yet clearly, the reference to a form of “unknown experience” recalls the masterful lesson by Hegel on this aspect—“*what is familiar is for that reason not known*” (Hegel, 2010, p. 13). On the contrary, precisely what is “known” is the least known, and one must *know how to see* in order to know it. Knowing how to see, however, is learning, and learning, in turn, means precisely detaching oneself from the “known” and its prejudices.

Accordingly, the task of philosophy is to teach how to see like this, i.e. by moving from the “known” to the known, which is anything but trivial and easy. The individual, in fact, quickly appropriates “as stages on a way that has been prepared and levelled” (Hegel, 2018, p. 15) the work of entire generations of human beings because it has already been metabolized in *culture* and *language*. This way, thought has become more than a second nature for human beings: we now think the same as we digest—with the same *unconscious automatism*, with the same *instinct*. Therefore, if we want to understand and assimilate the meaning of the world again, then we must bring the content that is already unconsciously present to the light. We need to shed a new light on it, make it a subject of reflection and understanding, and take it back in a conscious and not automatic form.

This explains how relevant and indispensable the anoetic level of consciousness is, which, as we said, was lacking from Husserl’s analysis. At this level, affectivity and emotions stand out, and the control system of the cerebral cortex is not called into question. I mean the upper centers that host the mental operations for perceiving and processing the information that comes from both the environment and the inner world. This is the first step of a process that presupposes and requires detachment from established routines and habits. In fact, if well understood and conducted, it can lead to enhanced metacognitive control. This stimulates and encourages the empowerment of the subject, thus awakening and renewing, contrary to what is believed, the intentionality of decisions and actions. It is precisely this that strengthens the relationship between the flow of experiences and the related reflection, which turns these experiences into subjects of phenomenological thematization.

Solms and Panksepp noted in this regard that:

This kind of a conceptual scheme can be readily overlaid on some major evolutionary passages of the brain, which roughly correspond to the evolution of (a) upper brainstem (up to the septal area), which permits *anoetic* phenomenal experiences, (b) lower subcortical ganglia and upper limbic structures (e.g., the cortical midline), which permit learning and noetic consciousness, and (c) higher neocortical functions (including all association cortices), which provide the critical substrates for the *autonoetic*, reflexive experiential blends that yield the stream of everyday awareness (Solms & Panksepp, 2012).

Thereby, Libet's experiments have had the merit of underlining a *consciousness of the unconscious*, made up of ballistic and automatic processes. This constitutes the indispensable starting phase of our decisions and actions. Some authors interpreted it in terms of the liquidation of free will and reduction of the functions of consciousness to pure illusions. They thought that the unconscious provides consciousness with everything before awareness emerges. However, such a position seems biased by an exclusive rather than privileged reference to sequential and linear explanatory mechanisms. In fact, quantum mechanics and the theory of complexity now strongly question such mechanisms. They have shown that the world is composed of processes and relationship networks that define objects and elementary constituents—not vice versa.

3 The dual nature of the body

Indeed, we should not mistake the brain-environment relationship with sequential situations of this kind, as Hofstadter properly emphasized. He highlighted the importance of introducing the “Strange Loop” concept to stress that we do not face juxtapositions and sequences but mechanisms of retroaction and mutual reinforcing. Let us go deeper to understand this reflection. Certain research underscored the function of the somatotopic arrangements of the cortical surface, which originate from the sensory receptors of the body's surface. This aspect of body representation corresponds directly to the *cortical homunculus*. Body representation, however, does not only coincide with the somatosensory cortex: it also includes the projection zones of other sensory modalities, which consist of topological maps of the different sense organs. It consists of the modality-specific subcortical thalamic and cranial nerve structures. These structures connect the terminal sense organs with the cortex. Body image does not originate from these mode-specific cortical maps alone. Solms and Panksepp call this aspect of bodily representation “external body.” It corresponds to what we perceive when we look at ourselves externally—in the mirror, for example—and think: “this thing is me;” “it is my body.” The authors emphasize that the various perceptual flows that originate from the projection zones and converge in the associative cortex complete the body image. The resulting representation is the work of the same brain mechanisms that also represent external objects.

The external body is therefore an object that we treat like all the other objects of the surrounding reality in which we are immersed. Therefore, it is no exaggeration considering it as the Husserlian “material body.” In fact, in its relationship with consciousness, it gives rise

to what Husserl calls “the naturalistic problem.” Motor maps also contribute to this external image of the body because the sensation of possessing a 3-dimensional body is determined not only by esteromodal sensory convergence but also by movement. Movement produces kinesthetic sensations and can generate intrinsic brain emotions in itself. The close relationship between movement and muscular and joint sensations is reflected in the anatomical proximity of the respective cortical areas: the somatosensory and motor projective areas form an integrated functional unit.

However, there is a fundamental difference between this specific *external* object—which is seen and managed, as I said, like all the other objects that make up the material reality around us—and the *internal body*. The latter is the self of perception and it is never represented as its object. Rather, it gives rise to a background feeling of ‘being’ that is anchored to the awareness of possessing an internal environment with a specific, characterizing organization. For this reason, we try to keep it as constant as possible. We can say, after Maturana and Varela’s theory of the autopoietic systems, that the internal body is the result of what we might call an operational closure. This defines classes of processes, which, in their operation, enclose themselves to form autonomous networks. These networks do not fall into the class of systems defined by external (heteronomous) control mechanisms. On the contrary, they belong to the class of systems defined by internal (autonomous) self-organization mechanisms.

Both the positive and negative fluctuations that inevitably occur when dealing with open systems during their exchanges with the environment are therefore “absorbed” in such a way that generally give rise to substantial stability when studied as a function of time. Thus, our body has a dual nature—that of an observing self and that of an observed object. It shall be highlighted that this conclusion may also be reached by referring to the historical and philosophical view that connects the following perspectives in reverse: Foucault’s investigations on the social constitution of the sense of body and disease and Caunguilhem’s groundbreaking essay on the normal and the pathological (Caunguilhem, 1991), which constitutes his most significant work. Caunguilhem wrote it in two phases, first in 1943 and then from 1963 to 1966, where it bluntly defined it as one of the deepest thoughts on our relationship with the body. In 1936, Leriche wrote: “health is life lived in the silence of the organs” (Leriche, 1936 in Canguilhem, 1991, p. 91). The author means that a subject’s state of health is the unawareness of one’s own body, whereas body awareness consists in the feeling of limitation, threat, and hindrance to health. The list includes Merleau-Ponty’s phenomenological developments on the experience of alienation from one’s own body (Merleau-Ponty, 1968). This view, for the purpose of a better understanding of our relation to our own body, emphasizes the opportunity of considering the relation between the normal and the pathological. This relation is the issue investigated by Canguilhem since, as Leriche puts it, in a fully healthy situation one has a poor awareness of one’s own body simply due to the silence of its organs. More recently LeDoux has reflected on this once again, claiming that “we know little about the state of our gallbladder, appendix, pancreas, liver, kidneys, and most other organs unless they malfunction and result in pain or other unexpected consequences” (LeDoux, 2015, p. 224).

The disease induces an awakening of the attention and interest for organs that are no longer silent. However, a sick body responds to neither will nor the social idea of normality. For this reason, it occurs as an experience of extraneousness. In other words, it constitutes that moment of passivity in which extraneousness occurs as the individual’s limit or threshold;

therefore, it is an experience of psychic extraneousness rooted in the heart of subjectivity. It corresponds to an active component, which is, just as Husserl thought, functional and structural. Here, the relationship between consciousness and body means a living consciousness that gives rise, as I said, to the embodied self, to the living body—and it is the object of phenomenology.

Therefore, from this point of view, Husserl is right when he emphasizes that the body cannot be reduced to a physicalistic explanation. The body in itself translates the intrinsically conscious/intentional character of non-conceptual, perceptual-motor representations. Accordingly, we cannot understand it adequately without taking into account the reflective dimension it expresses. It intrinsically exhibits the properties of bodily consciousness, both as a manifestation of the relationship between body and world—which becomes an intentional object in itself—and as a manifestation of the quirky status of the perceptive and sensory-motor body with respect to itself.

However, a “but” jeopardizes the validity of his point of view. I refer to the dividing line that Husserl sharply traces between two dimensions. The first one relates to what is material, imprint-related, passive, receptive, and somehow tacit. It is considered a latency background, an implicit horizon preceding or going along with acts of consciousness. It is closely connected to a genesis that constitutes the analyzed beings. The second dimension refers to the stages of vigil consciousness, mastering itself and its activity, toward which Husserl mainly orients his approach to the phenomenological problem. This is the greatest weakness in his approach. The scientific analysis of emotions initiated and developed by LeDoux (2012; 2015) particularly highlighted this point.

4 Personal identity as *κοινωνία*

In his research dedicated to emotions, LeDoux has clarified the essential function of affectivity and our body’s spontaneous and automatic reactions that escape from conscious control, at least in the initial stages. The relevance of his approach with regard to our issue stands out. It strongly challenges the idea that the limbic system is the only brain structure where emotions are generated. In fact, several limbic regions are not directly involved in emotional processes while several cortical areas are—with some significant consequences:

- a. If the limbic system participates in emotional processes, then this is neither the only nor the main system responsible for their elaboration.
- b. Some limbic areas are linked to cognitive processes, such as the hippocampus for memory.
- c. It is incorrect to isolate the subcortical limbic system from the activity of consciousness as if it were an independent module.
- d. Introspective abilities and related circuits are key for understanding the neuropsychological aspects of emotional life.
- e. Emotion studies were mainly concerned with fear and the fight-or-flight response it provokes, but the affective world is infinitely wider and has very different and higher-order faculties.

Having clarified this, however, we must say that, in LeDoux's opinion, the limbic system is the cardinal structure of the integration between experience, emotion, stress, pain, and neurovegetative and somatic reactions. Indeed, it links psyche and soma and therefore provides that interaction in which Husserl was interested, where the cingulate cortex plays a prominent role.

The role of the amygdala offers further evidence of this connection between the psyche and the soma. The amygdala, based on its anatomical connections,

- organizes the vegetative and hormonal behavioral responses of anger, fear, and anxiety, and.
- is involved in sexual and maternal behavior.

The activation of the amygdala also seems important for the convergence of emotional stimuli belonging to different modes (intermodal convergence), e.g. when we hear and see an angry person; anger is conveyed by both the tone of the voice and facial expression.

The amygdala is able to mediate the bodily component of emotions through projections in the central nucleus. The greater activity in the latter makes us think that, when fear is triggered, the greater response to the conditioned stimulus activates this component.

In addition, through its projections to the hypothalamus and the brain stem, the amygdala mediates the body's reactions that constitute the unconscious part of an emotional stimulus.

It should be emphasized, as proof of the aforementioned link between soma and psyche, that the amygdala is also important for the conscious experience of emotions. In fact, it projects to the associative cortical areas, particularly to the anterior cingulate cortex and to the orbitofrontal cortex.

This is precisely what allows us to argue, against the Cartesian dualism constantly referred to by Husserl, that mind and body constitute an inseparable unit. It is no longer possible to separate them in a dualistic, Cartesian way. The neuropsychological studies on meditation and hypnosis not only confirm the close relationship and the fundamental inseparability of psyche and soma. They also show that a *physiological, evolved, and intentional mental activity can consciously manage the body, emotions, neurovegetative reactions, and the activity of unconscious brain areas*. This implies, for example, activities and processes that allow us to "refocus" the attention and modify the instinctive and ballistic reactions that we have toward certain situations, e.g. claustrophobia (Facco, 2021).

So the theory of emotions finally took into due consideration the role of consciousness and introspection, i.e. at the neuropsychological level, the function of the systems involved in cognition—especially the lateral and medial prefrontal cortex, parietal cortex, and insula. Likewise, LeDoux emphasized the fact that his theory could not be developed without referring to the reflex mechanisms of neurovegetative responses. For over 20 years, we have been aware of the role of the anterior cingulate cortex (ACC), the insula cortex, the orbitofrontal cortex (OFC), and the ventromedial prefrontal cortex (vmPFC) as cortical sites of integration with the sympathetic and parasympathetic system. Precisely for this reason, as mentioned, they constitute the anatomical and functional basis of the inseparable mind-body unit. However, this should not be a reason to neglect the relevance and function of this passive and receptive dimension.

Without referring to this level, we could not adequately highlight what LeDoux considered the distinctive trait of emotions, namely their composite nature. This makes so that a

first-order manifestation (the stimuli and the first unconscious and subcortical codifications) is associated with the second-order, introspective phenomenon—where the awareness of the emotion and the stimulus that produced it emerges. Further processing includes both memory and the mental activity that modulates the responses and manages the behavior, which, in humans, is not stereotyped.

The relation between the affective dimension of emotions and the cognitive sphere does not show any break or continuity solution. Rather, it is configured as an integrated unitary process that already occurs in the twofold function performed by the stimulus and activated on the bio-boundary of our body. The latter jointly:

- produces a local reaction of the organism in the form of a homeostatic modification of the body states, giving rise to sensation, and.
- may constitute the distinctive feature of something external to the boundaries of one's own body and not merely upon it.

As Vallortigara puts it:

We can smell in itself the scent of a rose without reference to the rose object. This constitutes sensation. It exists as long as someone smells it. As the bishop Berkeley would say, its “being” consists in being perceived (*esse est percipi*). However, the scent of the rose also arouses our recognition of the external object; the scent functions as the cue of a quality belonging to the external object. The correlation with the object can be easily verified. In fact, if I walk away from that specific rose, the particular object of its fragrance will become increasingly weak until it fades away. [...] It is fundamentally the hedonic character of sensation deriving, according to Reid and Humphrey, from its motor origin: stimuli. These come to the surface of the organism—to its boundaries—and they may be pleasant or unpleasant, so the organism reacts with an appropriate response (Vallortigara, 2021, p. 98, my translation).

However, a discussion on affectivity cannot be limited, as it happens in Husserl's genetic approach, to the mere stage of origin, to the pleasant or unpleasant character of stimuli, and to the resulting response of the organism. No doubt, sensations and conscious experiences cannot occur without a value, which initially stems from the response to the stimulus: good → approach, not good → withdrawal. However, this does not mean that the hedonic phase should be constituted as a mere condition of possibility to be distanced and excluded from the subsequent stages since it is arbitrarily considered as more primitive and undifferentiated than conceptual thinking.

Emotions and feelings are higher-order activities, which cannot be considered in terms of pure passivity. They are inextricably entangled with reason and acts of consciousness, and cannot be hierarchically subordinated to them. Their composite nature makes them a haptic vehicle, the primary and principal instrument to project components of our body outside and to receive from environmental atmospheres and stimuli stirring and mobilizing consciousness. This is shown by the etymology of the word “emotion,” deriving from the Latin *e-movere*, which means to move, shake, or trouble since emotions and feelings are pleasant or unpleasant and provoke an appropriate and hedonistic response from the organism. Precisely for that, the issue of personal identity cannot be simplified by secluding it within the mind (in its double component, cognitive and phenomenal, intellectual and sensible) or within the body, meant in its mere functional and structural component. This would

mean underestimating content and matter. Indeed, personal identity should be considered the result of a sort of *κοινωνία* that is unity and participation—the mutual involvement of all these dimensions.

This *κοινωνία* seriously questions the idea of identity as a property and distinctive feature of a unique, indivisible, and separate entity. It leads to considering humans as complex creatures, composed of different components that live together and alternate. Because of this alternation and of the subsequent changes, one finds paths that are never identical. Paths are based on invariants but are mostly similar and able to coexist and live together, giving rise to a succession of events, stages, and differences that do not compromise their relation to the I. On the contrary, they enhance and deepen it, as Parfit (1984) and, more recently, Remotti (2019; 2021) have pointed out. We need to reverse our perspective by not putting the spotlight on beings. Rather, we should focus on the non-linear dynamic through which these beings become what they are.

This question was presented in Ancient Greece through the enigma of the Ship of Theseus, which conceptually challenged the permanence of identity in the case of a continuous, radical, and total transformation. The obsessive quest for the unchanging had overshadowed its essential traits, as Wittgenstein brought up again with his enlightening and surprising reflections:

in spinning a thread we twist fibre on fibre. And the strength of the thread does not reside in the fact that some one fibre runs through its whole length, but in the overlapping of many fibres.

But if someone wished to say: “There is something common to all these constructions—namely the disjunction of all their common properties”—I should reply: Now you are only playing with words. One might as well say: “Something runs through the whole thread—namely the continuous overlapping of those fibres” (Wittgenstein, 1958, p. 32).

An increasingly robotized cybernetics, an increasingly extra-human modeled sensor technology, an increasingly effective and invasive artificial intelligence, and a nanotechnology that opens to surprising universes, to say the least, allow the digital world to expand increasingly. This occurs in symbiosis with the lifeworld in an ever-closer alliance between biology and technology. It opens to new possibilities, implementing perceptual and cognitive abilities of the human person: because of that, it allows us to deepen and know them better.¹

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Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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¹ For further and deeper analysis, see De Toni et al. 2022.

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Silvano Tagliagambe is Professor Emeritus on Philosophy of Science at the Faculty of Architecture of the University of Sassari, in Alghero. He has been full Professor on Philosophy of science at the Faculty of Letters and Philosophy of the University of Cagliari, Pisa and Roma La Sapienza. He graduated in Philosophy under the supervision of prof. Ludovico Geymonat, then specialised in Physics at the Lomonosov University of Moscow and at the Russian Academy of Sciences, under the supervision of prof. Y.P.Terletskij and prof. V.A. Fock. He held a Chair of Philosophy of Science at the University of Cagliari, at the University of Pisa, at the University "La Sapienza" in Rome and at the School of Architecture of the University of Sassari

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