

PHENOMENOLOGY AND DEEP GENERAL ANAESTHESIA

Empirically Applied Phenomenology as a Leading Clue to Uncovering the Ultimate Neural Foundations of Consciousness

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Introduction

The physical, empirical foundations of consciousness at the lowest level belong in the greatest problems of contemporary science and philosophy. In the present talk I would like to make a proposal, how to contribute to the quest after the physical, more specifically, neurological bases of consciousness in a phenomenologically legitimate way. I would like to propose an experiment that is based upon emerging from deep general anaesthesia, and in which phenomenology is used in a meaningful and integrant manner. Phenomenology here refers to the philosophical method pursued by Edmund Husserl and his followers, as an elaborate method to investigate first-person subjective experience.¹

According to the phenomenological approach, an empirical theory of consciousness must meet certain criteria approved by the insights gained in the phenomenological attitude, in order to be conceived as phenomenologically adequate or at least plausible. When we reflect on ourselves under the phenomenological reduction, in the phenomenological attitude, we can acquire certain crucial insights regarding the fundamental nature of consciousness, which could serve as leading clues for empirical research. In my opinion, phenomenological reflection, particularly on the field of intersubjectivity, could also help us to solve – at least partially – the so-called ‘distribution question’,² which relates to the extension of the domain of possibly conscious beings. The particular topic that ultimately connects phenomenological investigations to empirical science is the *problem of embodiment*.

This presentation is divided into six parts. First, I am going to talk about the most general and important insights provided by the phenomenological reflection concerning the fundamental nature of consciousness. In the second part I will treat the problem of the body, while the main topic of the third part will be the animal consciousness. In the fourth section I

¹ Cf. e.g. Dermot Moran: *Introduction to Phenomenology*. London & New York: Routledge, 2002.

² Colin Allen & Michael Trestman: “Animal Consciousness”. In *Stanford Encyclopedia of Philosophy*, 2016. Hyperlink: <https://plato.stanford.edu/entries/consciousness-animal/> (Retrieved 14 August 2023).

will highlight a few empirical theories of consciousness. In the fifth section I will be speaking about how general anaesthesia can help us to uncover the ultimate bodily foundations of a concrete form of consciousness, which is also supported by a phenomenological, particularly Husserlian approach. Finally, in the sixth part, I would like to say some words about the distribution problem. Namely, I would like to speak about the question that if a subcortical theory of consciousness (such as Bjorn Merker's) could be verified from a phenomenological perspective, then how wide is the extension of the realm of conscious beings.

I. The Holistic Nature of Subjective Existence

Perhaps the most important insight the phenomenological reflection can provide us regarding the fundamental nature of subjective existence is its *holistic* character. It means that subjectivity appears to itself as a coherent and *organic* set of structures, which intimately and intrinsically belong together. One cannot change an element in this set without affecting every other element too.

When we are questioning back to the origins of consciousness in the natural world we do not think about higher layers and functions of mental life, such as conceptual thought, language, and sophisticated self-consciousness, but the lower and possibly lowest levels of consciousness, which are essentially purely sensible forms of consciousness. We can distinguish between three basic forms of purely or essentially sensible subjective experiences: namely, exteroception which is directed towards the world, interoception that presents us the internal states of the body, and evaluative-affective consciousness, that relates to the affective sphere.³ According to the holistic nature of subjective, conscious existence, these three basic modes of sensible experience belong together. No concrete conscious existence could be imagined in the absence of one aspect or another.

Especially in Husserl's late research manuscripts from the 1930s⁴, he made it very clear that according to him consciousness is characterized through and through by embodiment and its relatedness to the world. In his interpretation, the ego necessarily constitutes herself as an incarnated, social, historical person in the world. The microanalysis of consciousness discloses indications to embodiment, and intersubjective, cultural, historical, and natural environment. Without such indications and moments consciousness cannot be conceived as concrete.

³ Cf. Todd Feinberg and Jon Mallatt: *The ancient origins of consciousness. How the brain created experience*. Cambridge, MA: MIT Press, 2016; Simona Ginsburg and Eva Jablonka: *The evolution of the sensitive soul. Learning and the origins of consciousness*. Cambridge, MA: MIT Press, 2019.

⁴ Cf. e.g. Husserl: *Die Lebenswelt. Auslegungen der vorgegebenen Welt und ihrer Konstitution. Texte aus dem Nachlass (1916-1937)*. Edited by Rochus Sowa. New York: Springer, 2008: 251-258.

II. Embodied Subjectivity

According to Husserl's investigations, the first step of constitution of the ego as a concrete being, is the constitution of *her own body*. 'Constitution' here means the apriori order of appearances, an apriori order according to which the ego, the things, and the world as such appears to the ego herself.⁵ In Husserl's view, the ego cannot appear to herself in an entirely arbitrary, contingent way. In other words, the self-constitution of the ego, the process through which she appears to herself, has necessary, apriori laws. First of all, the ego perceives herself as a bodily being, and her own body appears as a *zero-point or origin* for the constitution of *space* around the subject.⁶

In Husserl's opinion, every concrete act of the ego involves the constitution of the body and the correlated constitution of space. The body can be experienced from the inside and from the outside. Husserl calls the internal aspect of the body 'Leib', and the external 'Körper'. It is important to know, however, that 'Körper' does not only mean for him the externally and visually appearing aspect of the body, sometimes he also refers with this term to the physical and transcendent side of our embodiment. From time to time, he also calls 'Körper' our physical body, which exists outside our head, in the nature, which is also a subject to natural laws, just like every other physical entity. In Husserl's opinion, these two sides of the body are constituted in an inseparable unity, as two sides of one and the same coin, and for apriori reasons.⁷ There is no Leib without a Körper, and – in the case of a living, sensing, experiencing animate organism – there is no Körper without a Leib either.

The next important step in Husserl's theory of the constitution of the body is his notion of a *bodily organ*.⁸ In his view, the body appears as *a concrete organization of organs*, which enables us certain functions and actions to do in the world. Just like the body as a whole, the concrete particular organs have internal and external aspects too. We experience them from the inside, and we have or at least can have experiences of the external side. Furthermore, just like

⁵ Cf. Robert Sokolowski: *The Formation of Husserl's Concept of Constitution*. The Hague: Martinus Nijhoff, 1970. *Introduction to Phenomenology*. Cambridge: Cambridge University Press, 2000.

⁶ Cf. Husserl: *Ideen zur einer reinen Phänomenologie und phänomenologischen Philosophie. Zweites Buch: Phänomenologische Untersuchungen zur Konstitution*. Edited by Marly Biemel. The Hague, Netherlands: Martinus Nijhoff, 1952. *Ding und Raum. Vorlesungen 1907*. Edited by Ulrich Claesges. The Hague, Netherlands: Martinus Nijhoff, 1973. *Cartesianische Meditationen und Pariser Vorträge*. Edited by S. Strasser. The Hague, Netherlands: Martinus Nijhoff, 1973.

⁷ To this: Dan Zahavi: "Husserl's phenomenology of the body". In *Études Phénoménologique*, 1994, 10(19): 63–84. *Husserl's phenomenology*. Stanford: Stanford University Press, 2003.

⁸ Cf. Husserl: *Ding und Raum*, 1973. Ulrich Claesges: *Edmund Husserls Theorie der Raumkonstitution*. The Haag: Martinus Nijhoff, 1965. Bence Peter Marosan: "Husserl on Minimal Mind and the Origins of Consciousness in the Natural World". In *Husserl Studies*, 2022, 38 (2):107-127.

in the case of the entire body, the internal and external aspects of an organ are constituted as parts of an inseparable unity also.

The next crucial issue in this context is that Husserl in *Ideas II* speaks about a *central organ*, whose task is to coordinate and harmonize the functioning of the other organs, and to realize – as Husserl says – the ‘*psychophysical dependency* of the soul on the body’.⁹ This central organ would be, according to him, the nervous system and the brain in particular. In other words, Husserl believed that it is the particular – and also phenomenologically justifiable – role of the nervous system to connect the soul – our entire mental life – to the body.

He thought that the connection between the soul and the body is partly, but not entirely empirical and contingent. He also expressed the opinion, however, that the lower layers of the soul – the capacity of sensible perception and its achievements, as well as proprioception – and the body have *an a priori and necessary* constitutive connection, just like the relationship between Leib and Körper. In his view, the higher mental faculties, such as rational thought, operated partly independently from the body.

This conception, however, in the light of later developments in phenomenology and neurology, could be revised, and Husserl’s idea of the constitutive connection between the lower levels of the mental sphere and the body, in my opinion, could be extended to embrace the entire mental sphere. According to such a revised notion of the constitutive connection between the soul and the body, *every mental content and capability refer to a physical, bodily basis as their carrier and realizer*.

From this revised conception of the constitutive connection of soul and body follows that the phenomenological self-reflection can inform and guide empirical research concerning consciousness, what to look for in the physical world, and where.

III. Animal Subjectivity According to Husserl

The constitution of the body is also a point of departure for Husserl for the constitution of intersubjectivity, whose anomalous cases are infants and animals. In this present context, the particular relevancy of the constitution of lower level or simpler subjects is provided by the above-mentioned ‘distribution question’, in other words, to which animate organisms can we

⁹ See Husserl: *Ideen zur einer reinen Phänomenologie und phänomenologischen Philosophie. Zweites Buch: Phänomenologische Untersuchungen zur Konstitution*, 1952: 288-297 (§63). See also Jeffrey Yoshimi: “Husserl on psycho-physical laws”. In *The new yearbook for phenomenology and phenomenological philosophy*, 2010, X, 25-42.

attribute consciousness in a philosophically – and from a Husserlian viewpoint: phenomenologically – legitimate way, and why?

Husserl had basically three ways towards the phenomenology of non-human minds. The first was visual, behavioral, functional similarity of a human and a non-human body. Human and non-human organs resemble to each other, most animals have a nervous system – which is, according to Husserl, a ‘central organ’ that realizes ‘psychophysical dependency’ –, and animals also have similarities in their behavior to human behavior. In Husserl’s view, we have no reason to doubt that pain behavior in an animal refers to an actual experience of pain.¹⁰ Husserl also considers the possibility that every living being – including organisms without a nervous system – might be conscious,¹¹ but, to my knowledge, he never made an explicit statement about that. However, he seems to be pretty sure that we can attribute consciousness at least to animals with a nervous system, such as a jellyfish (Qualle).¹²

The next question is, how can or should we imagine the mental life of an at least minimally conscious subject? In Husserl, we can find two, strongly correlated ways. The first is a deconstructive-reconstructive method (Abbau—Aufbau). According to this, we systematically abstract from the higher layers of our consciousness through self-reflection, and we attempt to disclose the lower layers in this way – and then we try to reconstruct subjects who most likely have also these lower layers of mental life. The second is eidetic, essential variation, through which we try to define what must necessarily belong to *the essence* of a minimal subject as a concrete being-in-the-world.

In Husserl’s view, a minimal subject should possess the capability to represent its bodily states to herself, to represent in a sensible way the environment (perception, memory, anticipation), she should have instinctive intentional structures, minimally conscious affective states and motor-kinaesthetic capabilities and processes. According to him, all these structures would enable a minimally conscious, but concrete way of being-in-the-world.

¹⁰ My example, not Husserl’s. Husserl, as far as I know, only speaks about the analogy and resemblance of human and non-human behavior.

¹¹ Cf. e.g. Nam-In Lee: *Edmund Husserls Phänomenologie der Instinkte*. Dordrecht: Kluwer Academic Publishers, 1993: 225-230.

This could be regarded as a variant of ‘biopsychism’ according to which every living being is conscious for a certain grade. To this recently: Evan Thompson: “Could All Life Be Sentient?”. In *Journal of Consciousness Studies* 29 (3-4):229-265.

¹² He treats the jellyfish (Qualle) as a minimally conscious being with her decentralized nervous system. See: Husserl: *Zur Phänomenologie der Intersubjektivität. Texte aus dem Nachlass. Zweiter Teil. 1921-28*. Edited by Iso Kern. The Hague, Netherlands: Martinus Nijhoff, 1973: 112-117. Marosan: “Husserl on Minimal Mind and the Origins of Consciousness in the Natural World”, 2022.

IV. Empirical Theories of Consciousness

If we want to have such an empirical theory of consciousness which has a phenomenological grounding, it should meet certain basic criteria set by the phenomenological reflection. According to this, consciousness, even at the lowest level, is a minimally conscious mode of being-in-the-world. It should be *concrete*, which means that its basic structures – perception of external environment and bodily states, memory, anticipation, flow of affections – must be present in the mental sphere of the organism, in an interrelated, entwined manner.¹³

There are literally thousands of different empirical theories regarding the genesis and fundamental nature of consciousness. In this presentation, there is obviously no room for even a superficial overview. Here we can only briefly mention the most popular approaches.¹⁴ Global Workspace Theory, Integrated Information Theory, and Neural Correlates of Consciousness are such leading conceptions regarding the origins and essential nature of consciousness.

According to Global Workspace Theory, contents in the brain become conscious when beside local processors they are processed and ‘broadcasted’ to other processors of the brain by a ‘global workspace’. In its ‘Global Neuronal Workspace’ version this ‘global workspace’ is connected to the *cortex*. Integrated Information Theory connects consciousness to any event of processing and integration of information. Finally, Neural Correlates of Consciousness, is a rather particularistic research project of identifying the neural correlates of particular conscious contents.

Our problem with Integrated Information Theory that it is all too formal and generous – it is open to *panpsychism*, which is a completely unjustifiable theory from a phenomenological perspective. Global Workspace Theory, in its ‘Global Neuronal Workspace’ version is just the opposite: it is very restrictive, it would delimit the capability of consciousness to animals with a cortex, to mammals, and perhaps birds. Finally, Neural Correlates of Consciousness, is all too particularistic for a strictly phenomenological approach.

We would like to join another theory, which in our opinion is a very promising approach from a phenomenological perspective: to Bjorn Merker’s conception, according to which certain subcortical parts of the brain (in the Mesodiencephalic regions) are responsible for the

¹³ Just to be clear: these factors should be considered as continents – to use a geographical analogy – in a phenomenology of consciousness, not as countries, not to mention cities and buildings. These are only the most prominent leading clues – a proper phenomenology of consciousness, guided by self-reflection or an interview method as in microphenomenology, should be incredibly nuancing and microscopic.

¹⁴ For an overview see: Anil Seth: “Models of consciousness”. In *Scholarpedia*, 2007, 2: 1328. http://www.scholarpedia.org/article/Models_of_consciousness. Accessed 14 August 2023.

emergence of primary or minimal consciousness.¹⁵ Merker’s theory describes consciousness as a feature of a concrete mode of an organism’s being-in-the-world – which harmonizes greatly with a phenomenological conception of the mind.¹⁶ According to Merker, consciousness is a fundamental feature of what he calls ‘core control system’, which consists of a complex decision-making system, a sophisticated motivational basis, and an ego-centric representation of the world.

An essential problem from a phenomenological point of view is how to verify a subcortical theory of consciousness in a phenomenologically legitimate way? That is to say, in such a way that the basic considerations of such a theory could be accessed from a first-person perspective. At this point of our presentation, we could finally refer to the possibility of an experiment based on emergence from deep general anaesthesia.

V. Emergence from Deep General Anaesthesia as a Possible Mean to Verify a Subcortical Theory of Consciousness from a Phenomenological Perspective

In the quest after the ultimate neurophysiological foundations of consciousness experiments based on emergence from deep general anaesthesia date back to the beginnings of the 1980s.¹⁷ In the last 20 years, since the early 2000s, these experiments have become more and more frequent and systematic. The basic idea is that in deep general anaesthesia the activity of the nervous system could be minimalized, and during the awakening researchers are observing which parts of the nervous system reach again normal level of activity first, and the participants are interviewed concerning their subjective experiences during emergence too. Researchers finally compare the data regarding neural activity during emergence from the anaesthesia, and the subjective account of the participants.

Not surprisingly, these results mostly supported the Global Neuronal Workspace Theory.¹⁸ I believe that its main reason that when experiment subjects are capable of speaking and

¹⁵ Bjorn Merker: “The liabilities of mobility: A selection pressure for the transition to consciousness in animal evolution”. In *Consciousness and Cognition*, 2005, 14(1): 89–114. “Consciousness without a cerebral cortex: A challenge for neuroscience and medicine”. In *Behavioral and Brain Sciences*, 2007, 30(1): 63–81.

¹⁶ Although Merker’s conception of consciousness has an emphatically *representationalist* feature, he talks about consciousness in terms of a ‘neural simulation’ of the world or a ‘neural fiction’, which is at odds with the prevailing (but, let’s add, not exclusive) *anti-representationalist* stance in phenomenological philosophy. However, in my opinion, it could be easily rephrased in a more phenomenological and anti-representationalist manner.

¹⁷ Uhl, R. R., K. C. Squires, D. L. Bruce, and A. Starr: “Variations in visual evoked potentials under anesthesia”. In *Progress in Brain Research*, 1980, 54: 463–466.

¹⁸ Cf. Mashour, G.A., B. J. A. Palanca, M. Basner, D. Li, W. Wang, S. Blain-Moraes, N. Lin, K. Maier, M. Muench, V. Tarnal, G. Vanini, E. A. Ochroch, R. Hogg, M. Schwartz, H. Maybrier, R. Hardie, E. Janke, G. Golmirzaie, P. Picton, A. R. McKinstry-Wu, M. S. Avidan, and M. B. Kelz: “Recovery of consciousness and cognition after general anesthesia in humans”. In *eLife*, 2021, 10: article e59525.

thinking in an at least relatively clear way, then the cortex is already fully operational. In my opinion, the current versions of experiments based upon recovery from deep general anaesthesia are incapable of verifying or falsifying a subcortical theory of consciousness. I believe, a crucial modification is necessary in order to conduct such experiments which could possibly contribute to the empirical verification or falsification of a subcortical conception of the mind.

I would like to propose such a version of this sort of experiments in which a multifunctional anaesthetic “cocktail” is used. One main component of this “cocktail” is to depress cortical activity, which could be done by e.g. propofol. And there would be another component also to enhance subcortical activity at the same time. For this other component pharmacological substances like Levodopa, amphetamines or Dimethyltryptamine could be efficacious, because they have an effect on those deeper cerebral regions too. My idea would be to keep cortical activity as low as possible, and – at the same time – increase neural activity in lower cerebral regions, especially in the Mesodiencephalic parts of the brain, as much as it could be done.

It should be noted that such an anaesthetic “cocktail” does not exist yet, it should be designed first. If we have something which could be used for such experiments, first tests on animals should be done, to check whether it could be safely used on human participants. If we have a way to depress cortical activity, and intensify subcortical processes, the second phase of such an experiment could begin.

In the second phase, before the cortical activity of the participants reaches its normal, pre-anaesthetic level, before they are fully awake, but already have an increased subcortical activity, participants should be stimulated by different patterns of visual or auditory signals. If, after recovery, they are capable of remembering any of those signals or patterns, that would be a really substantial, first-person related (that is to say, *phenomenologically accessible*) evidence for a subcortical theory of consciousness.

VI. The Distribution Question. The Possible Range of Conscious Creatures

If we could find some first-person perspective based or related evidence for Bjorn Merker’s theory, then the capability of concrete consciousness in the strict sense (the fundamental capability of clear, phenomenally conscious experiences) could be extended to all vertebrates, and perhaps even as far as lower-level invertebrates, such as insects.

This view could be made plausible both phenomenologically and empirically, because – if we keep in mind Merker’s model – there is a far-reaching functional isomorphism within the entire sphere of vertebrates. Furthermore, even lower-level invertebrates (Arthropoda) and vertebrates share remarkable functional similarities, from a certain point of view even

functional isomorphism. The structural continuity within different levels of biological complexity, in my view, provides a solid theoretical foundation for the present approach. Namely, if we can verify that certain particular structural and functional features are responsible for the lowest level of consciousness in humans, and we can identify the very same structural and functional features at a lower-level organism, then we don't have any reason to deny that the proper living being in question is conscious too, just like us.