The Structure-Phenomenological Concept of Brain-Consciousness Correlation¹

Johannes Wagemann Faculty of Liberal Arts and Humanities Witten/Herdecke University, Germany

Abstract

Based on a short presentation of the unexplained relation of brain and consciousness, the mereological fallacy is addressed as a main point of criticism on typical, especially materialistic attempts of solution. Facing the risk of an unreflected mixing of different descriptive levels, purified phenomenologies of brain and consciousness have to be elaborated. Comparing the analytical results, not only incommensurable aspects but also superordinated structure factors can be shown which allow us to formulate a first featurebased relation. Because this interim result does not disclose any evidence for a neurally based constitution of consciousness, an investigation of the structure-phenomenology of Herbert Witzenmann is embarked on as an intrinsic approach to consciousness research.

Spurred on by cognitive borderline situations, this approach is motivated and elucidated referring to its method and outcome. Following its path, it becomes possible to interpret certain findings of neuroscience and systematic self-observation in the sense of cross-border effects and to establish a trans-categorical correlation in the context of logical constitution. This innovative concept of correlations is illustrated by aspects of rhythmicity, topology and plasticity. The attempt to position structure-phenomenology between monism and dualism leads to a dynamic integration of this polarity. Implications for human constitution and philosophy are sketched shortly. Finally, an outlook is given on possible projects of trans-disciplinary research.

1. Characterization of the Problem

For the mind-brain problem different names and terms have been found in history. It is not only an expert topic in the world of the sciences but also pervades – more implicitly rather than explicitly – many forms of human culture, for instance as ideas of mankind or lifestyle philosophies. An artistic expression of this problem is illustrated by a painting of Milan Kunc which is significantly called "Peace of Mind" (Fig. 1). In this picture, obviously brain and consciousness of a human being are placed in relation

 $^{^{1}}$ This article gives a condensed version of Wagemann (2010a). A more accurate synopsis of this work has been published by Wagemann (2010b, 2011a).



Figure 1: *Peace of Mind*, by M. Kunc (1982/83). Courtesy of Kunsthalle Düsseldorf.

to one another. On the one hand we can see a neatly opened and voided facial skull sitting on its former interior – the brain. On the other hand a lively fire blazes out of the empty head which shows all signs of vitality and full awareness. The first relation may be interpreted to mean that human consciousness is necessarily based on the brain, whereas, in the second relation, consciousness may be construed as to be phenomenologically independent of the brain, because it apparently cannot be reduced to neural activity concerning its intrinsic, i.e. qualitative and logical properties. We are sure to know about our experiences, feelings and thoughts and, thus, it feels incorrect if they are said to be merely a shadow play of neural processes producing them. From this point of view, the painting expresses a separation as well as a connection between gray brain matter and the vibrant colors of consciousness. The question, therefore, is whether the ambivalence between dominances and dependences of brain and mind found in this puzzling picture can be resolved consistently.

Much – if not all – seems to be said on this subject and the debates get entangled deeper and deeper in abstract details without having reached a breakthrough to general agreement yet. However, concluding that this problem may be unsolvable would be careless and unscientific – careless since nothing is known about the existence of principally unsolvable problems. Problems can only be rated as not yet resolved, but this state is never fixed for all times. Furthermore, such an attitude is unscientific because science lives from facing the challenges of problems and questions and solving them. The aim should not be to eliminate uneasy questions by dogmatic decision or sophistic techniques, e.g. by declaring them as pseudo-problems. Insofar, one might ask what may be missing in the mostly discussed, critical or solution-oriented approaches.

Today's most frequent interpretations of the psychophysical puzzle entail a certain character of materialism or naturalism. The argumentative starting point of these approaches lies in the well-documented correspondence between neural and mental processes. On the one hand different aspects of consciousness (e.g. cognitive, affective, volitional performances) are correlated with specific forms of neural activity which are distinguishable by measurement. On the other hand neural dysfunction is accompanied by loss of specific mental performance. Therefore, materialist approaches in one way or another suppose consciousness to be a consequence of brain activity.

Although scientific and public opinion today does heavily depend on this attitude, sensitive gaps in the chains of reasoning can be shown. According to Bennett and Hacker (2003, p. 68f) a crucial point of criticism can be marked as a mereological fallacy (see also Fuchs 2009, p. 65f). This means to equate erroneously an entity as a whole (human subject as conscious being) with its partial conditions (brain processes) or partial aspects (individual mental performances). If the whole and the partial conditions and aspects belong to different levels, or categories, of description, there is the additional threat of so-called category mistakes.

Without any claim to completeness the mainlines of such a criticism to materialistic approaches are to be traced here. The aim is, however, not a mere repetition or variation of well-known arguments but, at the same time, the preparation of a new and solution-oriented concept. Roughly said this will bring the mentioned ambivalence of connection and separation of brain and consciousness to a phenomenally clarified and logically consistent balance. Apart from many other approaches, we do not presuppose some particular (alleged) connection between brain and consciousness, but carry out differentiated analyses of the subject-matters this means to take note of the hard problem of neurophilosophy in full sharpness (Chalmers 1995, Wagemann 2010a). This can be understood as a disclosure of "illegally" swapped contexts between different descriptive levels. In order to commit the mereological fallacy one must have acquired good arguments which promise to fix the defective reasoning concerning the partial conditions given by the brain. But it can be demonstrated, and will be further explained below, that these good arguments do not genuinely originate at the neural level of description.

One variant of such a questionable import of context is the mentalization of neural processes due to an information-technologically motivated use of language. Brain researchers as Roth (2002) talk about the brain as an "information processing system" without taking into account that both the starting and the end point (the source and the drain) of technical information processing are already in human consciousness – this means to presuppose the whole (conscious being) when speaking about its partial conditions (brain processes). Such undifferentiated usage of the term "information" and consequential gaps in argumentation have been critically highlighted by Janich (2009).

Another variant is a construction of mind from life processes. Since neural processing is embedded in the context of cellular regeneration, the productive and integrative character of life is simply assigned to neural processing.² However, cellular regeneration occurs in all living organisms – whereby a conceptual transfer of the vital to the neural and from there to the mental level seems to be invalid.

Comparing the brain with an unknown technical device would mean, in the first case, to tacitly consider the user as part of the machine. In the second case, it would mean to conclude the purpose of the machine from the type of power supply. Both lines of argumentation are logically inconsistent. The threat of such blended descriptive levels calls for the elaboration of purified, i.e. as far as possible disentangled, phenomenologies of mind and brain. Only on this basis does it make sense to put up a functional correlation of the two object areas.

2. Phenomenological Analyses of Brain and Consciousness

Avoiding detrimental imports of contexts between descriptive domains has consequences for the brain with regard to its neural processes. The strict phenomenological investigation of neural processing, originating in sensory stimuli, yields no indication of consciousness. Quite the reverse: Qualitative and contextual coherence, i.e. mentally relevant continuity, is removed step by step. The visual process of reception, for example, starts with a fragmentation of continuous stimuli into discrete, spatially and temporally digitized neural signals (Popper and Eccles 1982) and effectuates a qualitative effacement of its sensory origin (von Foerster 1998). The further processing is firstly marked by filtering, which accentuates mere quantitative differences, and secondly by an increasing divergence of the neural signals. Neither an anatomical terminus nor a genuine neural binding principle can be proven without reference to neural-mental correspondences.

A clue may be given by synchronous oscillations of neural networks recorded in parallel to a certain mental performance. They can be interpreted as an effect of an eventually self-organizing process (Singer 2002, Roth 2002) but in themselves they do not provide any binding principle

 $^{^{2}}$ This results in problematic equations like the following: "Living systems are cognitive systems, and living as a process is a process of cognition" (Maturana and Varela 1980, p. 13).

or constitutive basis for consciousness. This exemplifies the fundamental problem of all attempts to base mental states on neural processes; accurate examination shows that either consciousness is presupposed, or logical aporias concerning its constitution occur. One example for the latter can be found in the "exclusion argument" which consequently reveals an inadequate conception of emergence (Kim 2006).

If one strictly adheres to the methodological separation of descriptive levels, it seems to be quite impossible to find a transition from neural processing to phenomenal consciousness. As a sober result it should be noted that the brain not only cannot effectuate the suggested performances of an integration of neural signals to the production of consciousness. In point of fact it also shows the tendency to dissolve every mentally relevant context and coherence. Where integrative effects at the neural level corresponding to mental performance are to be detected, the brain cannot be considered as their causal origin, but only as their necessary condition. This conclusion is also supported by a critical analysis of evolution theory and by organological aspects which cannot be considered here for lack of space (see Wagemann 2010a,b).

Regarding the brain it is indisputable at least what and where it is and with which empirical methods it has to be scrutinized. However, with respect to consciousness the question for its phenomenal localization or conceptual definition, respectively, arises from the outset. If one compares different proposals for definitions of consciousness, two main tendencies emerge:

- understanding consciousness as a construction assembled by individual functional aspects or components (summary-inductive, see Vogeley and Newen 2003),
- 2. understanding consciousness according to one unitary principle (holistic-deductive, see Meixner 2003).

If we notice who proclaims one or the other variant, it soon becomes obvious that entire theories of consciousness are already lurking in the background of such definitions. Thus, summary approaches are normally favored by materialists and realists (because they allow convenient links to neuroscientific findings), while holistic approaches are preferred by consciousness-monists and idealists (because they advise to explain human constitution as a non-material entity). As, however, the premises of such polar theories of consciousness are mutually exclusive, it would be precipitate to attach one of these definition attempts. This problem has gone so far that, in some places, consciousness gets thematically discredited because it is considered as undefinable (Schnabel and Sentker 1997).

Instead, another option is to be outlined here which defines consciousness in a balanced and meta-theoretical way including summary as well as holistic aspects. The definitorial crisis at least shows that consciousness can be described as a polar affair in a superordinated sense as distinguished from the monothematic picture of the brain – if it is purified from all mentalizing attributions. The central polarity appears between the external, physiological-material conditions of consciousness and its internal, subjective-phenomenal character. Since these poles are not strictly confronted but connected by several somatopsychic and psychosomatic effects, a second orthogonal polarity arises. On the basis of these four features (matter/brain, mind/consciousness, somatopsychic effects, psychosomatic effects), a phenomenal typology of consciousness can be established – without the risk of falling back into one of the exposed philosophical positions.



Figure 2: Typology of consciousness and related consciousness theories.

This typology satisfies the summary aspect by characterizing consciousness due to particular features. In addition, it entails a decisively holistic character, because the features are directly linked to the four typical forms of consciousness theory: materialism, consciousness-monism, realism, idealism. Hence one could speak of an isomorphism (in the sense of structural identity) between an elementary typology of consciousness and a related system of consciousness theories (see Fig. 2). Therefore we propose to temporarily define consciousness as the area of tension of the relevant consciousness theories or philosophical attitudes, respectively.³

Hence, a superordinated polarity of consciousness emerges: On the one hand the reflexivity of this approach, i.e. the description of consciousness due to a well-ordered system of consciousness theories, expresses the aspect of self-referentiality of human consciousness, because all these theories are self-descriptions of consciousness.⁴ On the other hand, the mutual exclusion of the different monist and dualist theories exhibits the critical aspect of incoherence and self-exclusion of human consciousness –

 $^{^3}$ Suggestions in this direction have been made by Steiner (1914), Günther (1978), Witzenmann (1987).

 $^{^4}$ "This requirement emphasizes the reflective aspect of consciousness that is probably uniquely human. Reflecting upon our own experience is an example of metacognition, that is thinking about our thoughts" (Frith 2011, p. 2).

the still unanswered question for its origin or constitution, respectively. Without disposing of one integrative consciousness theory (at this moment at least) it becomes possible to characterize consciousness in a way avoiding the risk of detrimental conceptual transfer between levels: We are dealing with a phenomenology of theories and not primarily with the items concerned within them.



Figure 3: Feature-based relation between brain and consciousness.

Many details remain unconsidered in these brief characterizations of brain and consciousness. But focusing on their specific features is sufficient to work out a feature-based relation between brain and consciousness (see Fig. 3). For this purpose it is methodologically important to relate only those features which justify a relation by their own *structural equivalence* or *functional analogy*, respectively. This feature-based relation leads to the following conclusion: The performance of neural processing with respect to personal consciousness enables the fragmentation and dissolution of any mental context. Of course, this needs to be clarified in detail. Paradoxically, anyhow, the neural enabling function is to be comprehended as a kind of obviation, i.e. as an exclusion of mental coherence.

Although this radical consequence raises serious questions, it is compatible at least in one respect with the polar characteristic of the mental domain. The negative function of an exclusion of coherence is to be understood as a necessary and therefore positively valued factor for consciousness generation: Only from a mental confrontation with an actual loss of coherence and an experienced insufficiency can the challenge arise to generate structural coherence anew. In everyday life we are mostly able to successfully master this challenge. But since the mere facing of a challenge does not mean already coping with it, the sufficient condition of human consciousness – expressed in our apparent skill to generate coherence and perceive quality – can be no genuine performance of the brain, notwithstanding any "neuro-metaphysical" confessions. Consequently, it should be pursued in mental terms.

3. Central Motives of Structure-Phenomenology

An approach to an immanent and reflexive consciousness research, which has hardly been received by now, was developed by Herbert Witzenmann (1905-1988). Following Goethe's ideas and Rudolf Steiner's basic works (Steiner 1886, 1892, 1894), he developed and practiced what he denoted as structure-phenomenology. This concept is not to be confused with the eponymous approach of Rombach which stands in Husserl's tradition, even though it can be related to it in certain aspects. Witzenmann's structure-phenomenology starts from the question as to if and how the self-exclusion or self-forgetting of our everyday consciousness could be overcome towards its own constitution (Witzenmann 1983). If the subjectobject relation is essential for our mind, this question ought to be negated. Then no state of consciousness is placed prior to the subject-object division which could give evidence about its developmental constitution.

Steiner presented a systematic phenomenology of pre-subjective and pre-objective states and processes, which Witzenmann extended in terms of method and logical constitution. If such states and processes really exist, they certainly cannot be apprehended, discussed, and formalized in the same way as constituted subjects and objects. Hence, respective statements of Steiner and Witzenmann should not be taken as theoretical derivations or apodictic claims but rather as observation reports which could be taken as hints, suggestions and working hypotheses towards one's own observation. To do justice to the processuality of the actual genesis of consciousness, an "eye opening", i.e. referential-motivational usage of language and concepts, is needed. In this way, an education of procedural and pre-linguistic awareness can be enabled.⁵ This education includes both self-observation and self-modification of mental action – so the aim is neither inductive nor deductive reasoning but an indicative elucidation of the actual consciousness process (cf. Witzenmann 1983, p. 10).⁶

A first step in this direction can be the methodological cultivation of cognitive borderline situations concerning, e.g., the experience of modern art, critical moments in social life or practiced meditation. Goethe (1992) already writes about the uncertainty to distinguish a falling leave from a moving bird in twilight. In such situations, known in cognitive science as bi- or multi-stable perceptual phenomena, the delayed creation of shape and meaning facilitates an extension of cognizant phases – and, thus, a progress into pre-subjective and pre-objective procedural states – provided that one is willing and able to rise to the challenge of such critical, unstable situations.

 $^{{}^{5}}$ Steiner (1886, p. 40) calls this aspect of linguistic usage "Blicklenkung". Oevermann (2008) in this context refers to the *deictic function* of language.

⁶See also Wagemann (2010a, p. 193) with respect to the relation between inductive and deductive methodological aspects of the *indicative method* on the one hand and of *abductive reasoning* conceptualized by Peirce on the other.



Figure 4: Tridim-Q by V. Vasarely (1968).

Special cases of such unstable situations are images like the one shown in Fig. 4. This painting of Vasarely can be interpreted in several combinations of convex and concave shapes: We can see a small cube standing above a big cube, or a big cube with a small cubic cavity, or a big cubic space with a small cube in the corner. With a little practice we can arbitrarily change our view to one of these variants. Two basic forms of intrinsic mental activity become detectable in this way. Firstly, the autonomous decision for one of the possible views, i.e. the *production* of a content (e.g. convex or concave); Secondly, the test if and how the anticipated content consolidates the visual stimulus, requiring experimental *retention* or *reception*, respectively.

Now it is of decisive importance, as asserted by Steiner and Witzenmann, that producing and retaining are not only relevant forms of action in view of ambiguous images, but in any process of consciousness generation which results in a subject-object-relation (Steiner 1894, Witzenmann 1983). Tracing them back to their phenomenal origins finally reveals that these forms of action ensure our access to pre-subjective and pre-objective structure components.

Let us begin with the receptive action. Its character and role in the process of consciousness generation can easily be demonstrated with respect to unpleasant borderline experiences like perceptual confusion, fright or shock. In such extreme states, our mental activity goes through short moments of total retention in which we lose any context and are confronted with an incoherent aggregate – unless we are passing out. But if we remain conscious we can distinguish a kind of critical boundary in our mental activity (Steiner 1886, Witzenmann 1986). In our everyday consciousness, this boundary element appears already focused and controlled, so we mostly ignore it. It just becomes noticeable when the well-trained, accustomed everyday routines of cognition break down – in other words,

when our attempt of cognition fails. Steiner calls this boundary element the *pure percept*⁷ (Steiner 1894).

Because the pure percept, in its strangeness, can be discerned clearly from our own mental activity, it raises the challenge of a coherenceproducing acquisition process. Philosophers like Oevermann or Waldenfels underline the relevance of an extraordinary critical element for the consciousness process (Oevermann 2008, Waldenfels 2006) – but they do not draw any significant conclusions concerning the role of neural processuality. In the same context, William James speaks (according to Fechner) of a "psycho-physical threshold" which always has to be lowered in the generation of consciousness (James 1898). Asking then where the pure percept may come from, we may refer to the above-mentioned featurebased relation: The pure percept has to be identified as an effect of neural processing. Witzenmann calls this functional aspect of brain activity decomposition or derealization (Witzenmann 1986).

Because of the total, pre-subjective and pre-objective incoherence of the pure percept, our mental activity turns away from it and towards the production of coherence, which can be, e.g., an (alternative) interpretation of an ambiguous image. The radical evolvement of producing action empirically causes the appearance of conceptual coherence as an equivalent structure component, which Steiner and Witzenmann call the pure concept (Witzenmann 1983). Here one can again differentiate between individual performance and structure component: In order to acquire a particular conceptual content, e.g. convexity or concavity, I have to make an effort in my individual activity. Obviously my effort is not identical with the lawfulness of its result, because my action can be omitted or may fail – to be noticed through the fact that the sparking insight fails to appear. But if successful, my attempt of producing leads to a dynamic state of interchange and connection between individual performance and consistent regularity, which is capable of connecting perceptual fragments (Witzenmann 1983, p. 40f).

Looking back at the phenomenological analyses of brain and consciousness and the deconstruction of typical neurophilosophical approaches, conceptual coherence as discussed above cannot be found in the brain. So it has to be conceptualized otherwise, which will be motivated shortly:

- 1. Because the pure percept does not include any coherence spontaneously, every such coherence, be it objective or mental, must arise by addition.
- 2. There is no theory of the brain which could justify its eventual productivity of genuine mental coherence – so this function should con-

⁷Steiner's and Witzenmann's *pure percept* is to be distinguished from *pure experience* described by James (1912). The latter includes incoherent as well as coherent aspects while the former is exclusively characterized by total incoherence.

sequently be assigned to a system of the whole human organization which is logically independent of the brain but stays in a procedural relation to it.

3. The conceptualization of constitutive coherence irreducible to brain activity requires its comprehension as a mentally self-founded, autological structure potential.

These points refer to the structural-phenomenological concept of universals developed by Witzenmann (1994). It cannot be formally proven because each proof from the outset presupposes the coherence of basic axioms and of proof techniques (Steiner 1892). But of course the concept of universals can be elucidated by logical argumentation (as shown above) and validated in its empirical dimension – for example with an adequate interpretation of certain findings of current meditation research (Wagemann 2011b).⁸

The occurrence of mental states of incoherence has already been related to neural decomposition. Now the relations between the adressed coherence potential and individual mental structures as well as the neural level are to be clarified. In this way, the mentioned forms of access to the polar structure components of consciousness can be understood as *equivalence relations*. This resembles an extension of Empedocles' and Goethe's principle of "like is known by like" (Goethe 1977). One also could speak of a matching between equalized conditions for structure generation prior to everyday cognition: The emerging structure component is induced by form and intensity of individual mental action (see Fig. 5).



Figure 5: Basic structure of consciousness due to Witzenmann.

⁸Furthermore, the concept of universals is confirmed in some of its aspects by other philosophers: Peirce (1991) with his concept of continuity (cf. Zink 2004), Popper (1978) with his theory of "three worlds", Oevermann (2008) in terms of objective sense structures, and Heinrichs (2007) with regard to a "sense medium".

According to these relations between activity and percept or concept, respectively, every apprehended structure can be understood as an equivalence relation between percept and concept.⁹ This kind of equivalence is indicated through a certain dynamics in which both components partially dispense their own characteristics in favor of each other. The percept will be embedded in the conceptual coherence (universalizing) and the concept will be fixed on an individual case (individualizing). Witzenmann calls the dynamic equivalence relation of concept and percept the *basic structure* (in German "Grundstruktur"; Witzenmann 1983). According to structure-phenomenology, every stable consciousness content originates in the periodic interplay of such relations.

4. Trans-Categorical Correlation

As we have argued, every mental structure arises from the equalizing counterflow of individualizing and universalizing which is induced and accompanied by individual mental action. Thus, mental structures are recompositions of neurally caused decompositions.¹⁰ Because, as part of this dynamics, critical incoherence is overcome, the actual genesis of consciousness can be understood as a stabilizing suppression of the neural instability constraint, negating the decomposition function. Within recomposition, critical incoherence is surmounted in two directions: (1) mental activity turns away from the pure percept to produce conceptual coherence, and (2) it turns back toward the pure percept to pervade it with coherence.

The associated fixation of the concept essentially depends on the acceptance by the percept. In other words: The pure percept offers not only provoking incoherence, but also provides an individualizing abutment or, so to speak, a point for conceptual cristallization. So, besides the decomposition function of neural processing, its enabling function is also a tool of individualizing. The mentally relevant brain functions can be conceptualized as constraining (decomposition) and enabling (individualizing), whereas the required structure coherence cannot be taken from the neural level but has to be assigned to the conceptual potential addressed.

These aspects of a trans-categorical correlation can be substantiated by a number of phenomena. Successively ensuring a perceptual content

⁹In terms of a *procedural equivalence relation* definable on the set of mental observables the property of transitivity, which is especially crucial for structure founding, could be formulated as: $a_p \sim C \land a_r \sim P \Rightarrow C \sim P$ ($a_p =$ producing activity, $a_r =$ retaining activity, C = concept, P = percept).

¹⁰An interesting parallel can be drawn here with the process of measurement in quantum mechanics: "Measurement suppresses (or minimizes, to be precise) the connectedness constituting a holistic reality and generates locally separate (or approximately separate, to be precise) objects constituting a local reality" (Atmanspacher 2012a).

and enriching it with details is guided by our interest and requires a very fast periodic interplay of individualization and universalization, i.e. many cycles of recomposition. The neural correlate of this mental rhythmicity might be the above-mentioned oscillation of neural assemblies. Here it is important to differentiate between synchronous and asynchronous oscillations of neural assemblies and – in terms of topology – between local and global brain activity.

Normally, the synchronous aspect of neural oscillation is overemphasized, because it can easier be related to certain mental performances. But as argued above, these mental performances cannot be explained on the basis of mere brain activity anyway. Now the local synchronization of neural oscillation can be interpreted as a neural effect of mental recomposition. And the asynchronous activity of the remaining brain can be interpreted as decomposition being effective on the mental side. The rhythmical interchange of the area-specific functions and effects finally results in a trans-categorical framework of correlations as depicted in Fig. 6.



Figure 6: Trans-categorical correlations between mental and neural descriptions.

Neural decomposition refers to the mental decomposition effect; mental recomposition results in the neural recomposition effect (see Fig. 6). Besides the rhythmical and topological aspects of brain activity, its plasticity deserves attention as well: the alteration of neural connectivity persisting for longer or shorter periods. The residual signature of contextual coherence detectable in the hierarchically structured activity of neural networks – mostly interpreted as a genuine neural "coding principle" (e.g. Tsien 2007) – appears, in the structural-phenomenological context, as passive traces of stabilizing mental activity. These traces are taken up again in the structural role of percepts as part of memory tasks (Witzenmann 1983).

The outlined correlation concept is a clarification of the previously discussed feature-based relation. In this form, it no longer merely confronts the different phenomenal domains, but also connects them in the sense of a superordinated anthropological function and philosophical conception. Important implications in this respect will be discussed in the final section.

5. Consequences for Human Constitution and Philosophical Conception

At this point, a possible misunderstanding must be eliminated: the opposition between percept and concept as well as between neural and mental level do *not* entail an ontological dualism. In fact, the realization of area-specific phenomena only implies a property-dualist account at most. And with the identification of trans-categorical functions and effects the strictly parallel separation of the descriptive levels is already countered in the first place. Metaphorically one could speak of an *osmotic relation* between levels – based on the finding that certain effects occurring at both levels could be interpreted as trans-categorical interactions (decomposition effect at the mental level, recomposition effect at the neural level). The notion of osmosis is not to be understood in a physical (material-energetic) context, but solely in a functional respect. It offers a conception which dynamically integrates demarcation and pervasion.

A trans-categorical osmosis can only be supported by features which are relevant for both levels in a superordinated sense (referring to the feature-based relation: coherence-incoherence, order-disorder). Correlations between functional consciousness generation and brain activity refer to both a systematic origin and the evolutionary development of the human condition: Cross-level correlations can be interpreted due to an underlying monistic domain whose aspects indicate its stratification into distinguishable layers.¹¹ Such hierarchical and asymmetrical relationships between demarcation and pervasion are also crucial in Hartmann's (1954) concept of ontological layers or Lauber's (2001) work on the concept of information.

This point of view can be endorsed by considering the two structure components of concept and percept. They are structurally complementary insofar they are opposed to one another: they do not represent equivalent constitution principles just because their phenomenal appearance is due to different ways of acquisition. The pure percept is given to us by neural decomposition, that means without our active support, whereas the pure concept cannot become relevant for recomposition without our activity. As a critical point of departure, the passively given decomposition marks a radical boundary of consciousness. Since this demarcation is overcome by every successful act of mental structuring, it entails neither an ontological nor an epistemological dualism. Concept and percept are rather related in a transient or *procedural duality*. Apart from this, the pure percept cannot be claimed as an ontological principle, simply because of its total incoherence.

 $^{^{11}}$ "When a symmetry is broken, correlations emerge between the resulting domains. These correlations are remnants, as it were, of the wholeness that is lost due to the broken symmetry" (Atmanspacher 2012a).

Because in both respects, ontologically as well as epistemologically, only one constitutional principle is required, the structural-phenomenological concept has to be considered as monistic in terms of *foundation*, whereas in terms of *development* it has a quasi-dualistic character. This form of a procedural duality between concept and percept has the status of an indispensable condition for the development of consciousness, whereby development refers to both the evolutionary and the actual-genetical context. In the interest of a unitary conception of the human condition it seems adequate to integrate the initially opposed, then correlated levels of description into an overall organization. As described, mental activity reaches actually through the neural condition system while overcoming the decompositional demarcation – therefore the neurobiological cycle of functionality is coupled into the cycle of mental processuality (see Fig. 7).



Figure 7: Integration of phenomenal domains.

As a result, the mentioned functions and forms of activity become integrated and related in a dynamical pervasion: (a) decomposition (global), (b) producing, (c) retaining, (d) plasticity (local). Although this scheme accentuates the pervasion of the physical and the mental layer, their phenomenal and functional discernability is still maintained. Such discernability not only pertains to the mental and the physical layer, but also (as shown in Sec. 3) to individual action and universal structure potential. Finally, an overall organization arises which is subdivided into three functional zones (see Fig. 8):

- physiological tool system (condition of insufficiency/abutment for individualizing),
- 2. mental activity (producing/retaining),
- 3. universal potential of reality (autological/customizable).

In accordance with traditional labels, one can speak of body, soul and mind. But one has to emphasize that this functional trichotomy does not arise from mystical revelation or metaphysical speculation, but results from a methodologically based approach and is a mutual consequence of neurobiological and structural-phenomenological findings.



Figure 8: Anthropological scheme.

Based on these results, a philosophical evaluation of the described approach is possible which yields a dynamic and integrative relationship between monist and dualist accounts. These basic philosophical moves, key features in different consciousness theories, can now be comprehended in light of the actual genesis of consciousness. The fact that monism and dualism are both inextricably linked (combining epistemic and ontic aspects) and mutually exclusive (with respect to the ontological premises) can be traced back to certain monist and dualist "phases" in the process of consciousness. The four typical forms of theory, two monist and two dualist, are incompatible at the level of discursive argumentation, but expanding them into procedural self-observation, their joint context is unveiled.

The world seems dualistic to us if we accentuate the polarizing or mediating role of our mental action between the structure components concept and percept. And it seems monistic to us while we dwell in the biased alignment of our action towards one of two structure components. According to the current orientation of our performed mental action we virtually become materialists (percept-dominated), consciousness monists (concept-dominated), realists (individualizing effect) or idealists (universalizing effect). So the origin of different, even incommensurable philosophies can be located in an abstract overemphasis of certain phases or components in the pre-conscious process of consciousness generation (see Fig. 9).

In this sense, to apply a philosophical method does not mean to adopt and vindicate a single position in the brain-consciousness debate, but



Figure 9: Genesis of the different consciousness theories of Fig. 2.

rather to apprehend the meta-philosophical integration of all positions in their procedural context. Günther (1978) has pointed out that in the struggle of opposing philosophical worldviews, which is based on a twovalued logic, none of the opponents can prevail since they are equipotent concerning their logical structure (Günther 1978). In contrast, the suggested concept of a procedural and integrative definition of consciousness represents an advance into the field of intrinsic and transpersonal consciousness research which can be formalized by means of a trans-classical and process-oriented logical framework.¹²

All in all, the structural-phenomenological concept, although hardly noticed in current philosophy of mind, opens an innovative and integrative approach to a solution of the mind-brain problem – and, on a broader front, also of the psycho-physical problem in general. Of course, this claim implies a lot of questions to be dealt with in future detailed investigations. For example, the already initiated revision of structure-theoretical key concepts like *information, energy* and *emergence* has to be continued to involve the trans-disciplinary references of this approach.¹³

Also the contextualization of Witzenmann's structure-phenomenology around philosophical phenomenology and anthropology has to be further developed. The structural-phenomenological concept of correlations offers new options for future collaboration of natural sciences and the humanities on an equal methodological footing – especially when subjects in experiments no longer have to be understood as mere data suppliers. They can develop by practicing mental training towards co-researchers who can record phases of consciousness generation which otherwise remain pre-conscious. This way, new hypotheses, which relate different forms of neural activity to the fine structure of mental processes, could be formulated and tested. For example, it can be asked how the parameters of neural processes would react in mental stages of individualizing and universalizing. Do local and global processes periodically alternate, as Bigalke (2007) suspects? In order to face such questions about neura lmental rhythmicity, topology and plasticity, proper experimental designs, mediating between a systematically founded first-person phenomenology and third-person brain research, will need to be set up.

¹²The author is currently working on this issue.

¹³Concerning *emergence* it could be considered to combine the notion of *submergence* (Wagemann 2010a,b) with a recast kind of emergence, perhaps in the direction of *contextual emergence* pointed out by Atmanspacher (2012b). So a neural "statistical description" could be comprehended as an intermediate stage between the "individual" neural and the mental levels. On the one hand, statistical states stand for generalized (i.e. universalized) neural states according to mental stability. On the other hand, they stand for specified (i.e. individualized) mental states according to neural constraints. This perspective would require first to differentiate the statistical states respecting neural and mental aspects and, secondly, to understand them as results of a transcategorical process.

References

Atmanspacher H. (2012a): Dual-aspect monism à la Pauli and Jung. *Journal of Consciousness Studies*, in press.

Atmanspacher H. (2012b): Identifying mental states from neural states under mental constraints. *Journal of the Royal Society Interface Focus* **2**, 74–81.

Bennett M. and Hacker P. (2003): *Philosophical Foundations of Neuroscience*, Blackwell, Oxford.

Bigalke H. (2007): Wahrnehmungswechsel mehrdeutiger Bilder in Abhängigkeit vom Präsentationsmodus. Untersuchung visuell evozierter Potenziale. Dissertation ALU Freiburg. Manuscript available at www.freidok.uni-freiburg.de/ volltexte/6173/pdf/Dr.Arbeit_29.11.08.pdf

Chalmers D. (1995): Facing up the problem of consciousness. *Journal of Consciousness Studies* **2**(3), 200–219.

Foerster H. von (1992): Entdecken oder Erfinden. Wie lässt sich Verstehen verstehen? In *Einführung in den Konstruktivismus*, ed. by H. Gumin and H. Meier, Piper, München, pp. 41–88.

Frith D. (2011): What brain plasticity reveals about the nature of consciousness: commentary. *Frontiers in Psychology* **2**, 1–3.

Fuchs T. (2009): Das Gehirn – ein Beziehungsorgan. Eine phänomenologischökologische Konzeption, Kohlhammer, Stuttgart.

Goethe J.W. von (1977): Schriften zur Naturwissenschaft (Auswahl), Reclam, Stuttgart.

Goethe, J.W. von (1992): Goethes Gedichte in zeitlicher Folge, Insel, Frankfurt. Günther G. (1978): Idee und Grundriss einer nicht-Aristotelischen Logik. Die Idee und ihre philosophischen Voraussetzungen, Meiner, Hamburg.

Hartmann N. (1954): Einführung in die Philosophie, Hanckel, Osnabrück.

Heinrichs J. (2007): Ökologik. Geistige Wege aus der Klima- und Umweltkatastrophe, Steno, Varna.

James W. (1898): Human Immortality. Two Supposed Objections to the Doctrine. Available at www.des.emory.edu/mfp/jimmortal.html.

James W. (1912): *Essays in Radical Empirism*, Longman, Green & Co, New York.

Janich P. (2009): Kein neues Menschenbild. Zur Sprache der Hirnforschung, Suhrkamp, Frankfurt.

Kim J. (2006): Emergence: Core ideas and issues. Synthese 151, 547-559.

Lauber R. (2001): Was ist Information? In *Computer Aided Design of Dynamic Systems*, Scientific Papers of Donezk State Technical University, Vol. 29, Sevastopol, Ukraine, pp. 18–35.

Maturana H. and Varela F. (1980): Autopoiesis and Cognition. The Realization of the Living, Reidel, Dordrecht.

Meixner U. (2003): Die Aktualität Husserls für die moderne Philosophie des Geistes. In Seele, Denken, Bewusstsein. Zur Geschichte der Philosophie des Geistes, ed. by U. Meixner and A. Newen, De Gruyter, Berlin, pp. 308–388.

Oevermann U. (2008): "Krise und Routine" als analytisches Paradigma in den Sozialwissenschaften. Manuscript available at www.ihsk.de/publikationen/ Ulrich-Oevermann_Abschiedsvorlesung_Universitaet-Frankfurt.pdf.

Peirce C.S. (1991): Naturordnung und Zeichenprozess. Schriften über Semiotik und Naturphilosophie, Suhrkamp, Frankfurt.

Popper K. (1978): Three Worlds. The Tanner Lectures on Human Values. See www.tannerlectures.utah.edu/lectures/documents/popper80.pdf.

Popper K. and Eccles J. (1982): Das Ich und sein Gehirn, Piper, München.

Roth G. (2002): Die Zukunft des Gehirns. Gegenworte. Zeitschrift für den Disput über Wissen **10**, 15–20.

Schnabel U. and Sentker A. (1997): Wie kommt die Welt in den Kopf? Reise durch die Werkstätten der Bewusstseinsforscher, Rowohlt, Hamburg.

Singer W. (2002): Der Beobachter im Gehirn. Essays zur Hirnforschung, Suhrkamp, Frankfurt.

Steiner R. (1886): Grundlinien einer Erkenntnistheorie der Goetheschen Weltanschauung, Rudolf Steiner Verlag, Dornach.

Steiner R. (1892): Wahrheit und Wissenschaft. Vorspiel einer Philosophie der Freiheit, Rudolf Steiner Verlag, Dornach.

Steiner R. (1894): Die Philosophie der Freiheit. Seelische Beobachtungsresultate nach naturwissenschaftlicher Methode, Rudolf Steiner Verlag, Dornach, Neuauflage 1918.

Steiner R. (1914): Der menschliche und der kosmische Gedanke, Rudolf Steiner Verlag, Dornach.

Tsien J. (2007): Der Gedächtnis-Code. Spektrum der Wissenschaft **10**(7), 46–53.

Vogeley K. and Newen A. (2003): Ich denke was, was du nicht denkst. Gehirn & Geist $\mathbf{2}$, 52–59.

Wagemann J. (2010a): Gehirn und menschliches Bewusstsein – Neuromythos und Strukturphänomenologie, Shaker, Aachen.

Wagemann J. (2010b): Strukturphänomenologische Anthropologie – ein transdisziplinärer Ansatz zur Korrelation von Gehirn und Bewusstsein (Teil 1). *Re*search on Steiner Education 1(2), 83–95.

Wagemann J. (2011a): Strukturphänomenologische Anthropologie – ein transdisziplinärer Ansatz zur Korrelation von Gehirn und Bewusstsein (Teil 2). Research on Steiner Education 2(1), 34–47.

Wagemann J. (2011b): Meditation – Research as Development. Research on Steiner Education 2(2), 35–49.

Wagemann J. (2011b): Meditation – Untersuchungsgegenstand, Forschungsmittel und Entwicklungsweg. Research on Steiner Education 2(2), 50–65.

Waldenfels B. (2006): Grundmotive einer Phänomenologie des Fremden, Suhrkamp, Frankfurt.

203

Witzenmann H. (1983): Strukturphänomenologie. Vorbewusstes Gestaltbilden im erkennenden Wirklichkeitenthüllen. Ein neues wissenschaftstheoretisches Konzept, Gideon Spicker, Dornach.

Witzenmann H. (1986): Die Voraussetzungslosigkeit der Anthroposophie. Eine Einführung in die Geisteswissenschaft Rudolf Steiners. Erkenntniswissenschaft als Ontologie. Ein neues Zivilisationsprinzip durch meditative Bewusstseinswandlung, Freies Geistesleben, Suttgart.

Witzenmann H. (1987): Goethes universalästhetischer Impuls – Die Vereinigung der platonischen und aristotelischen Geistesströmung, Gideon Spicker, Dornach.

Witzenmann H. (1994): Die Kategorienlehre Rudolf Steiners, Gideon Spicker, Krefeld.

Zink J. (2004): Kontinuum und Konstitution der Wirklichkeit. Analyse und Rekonstruktion des Peirceschen Kontinuum-Gedankens. Dissertation LMU München, available at edoc.ub.uni-muenchen.de/2385/1/Zink_Julia.pdf.

Received: 10 January 2012 Accepted: 29 January 2012