

Studi - Repliche

Replies to Parrini, Di Francesco & Tomasetta, Maleeh & Stephan, Hoerzer, and Roth

Sandro Nannini

Ricevuto: 29 luglio 2014; accettato: 16 ottobre 2014

FIRST OF ALL, I AM very thankful to the authors of the peer commentaries for the attention with which they analyzed my paper. Their acute questions and objections have greatly helped me to reflect on my conception of consciousness and have encouraged me to try and make it clearer.

I recognize the validity of an observation made by Hörzer who critiqued the disproportionate attention I devoted to the Theory of Relativity in the first part of my paper, compared to that devoted to my proposals regarding the naturalization of consciousness in the second part.¹ Therefore, I would like to further clarify here in these replies what I mean by the reduction of mental states to brain processes. I shall do that by examining a conscious visual perception. Then I will use my reflections on this example to answer the questions and objections that have been raised in the commentaries.

(1) *The traffic light in front of me is red. I see it and stop my car*

In order to operate a draft of a regimentation of (1), a common sense statement, I shall introduce the following conventions:

a) I shall replace the statement “The traffic light in front of me is red” with p

and I shall refer by $[p]^2$ to the fact that the traffic light in front of me is red whereas I shall refer by $[p^*]$ to the subjective content of my visual perception of $[p]$ (that is, $[p^*]$ is $[p]$ as it appears to me);

b) I shall introduce the propositional attitude $[(See(I^*, [p^*]))]$ as the nominalization of a statement that describes the relation between me (as I appear to myself, that is, as an I^*) and $[p^*]$ by means of the two-place predicate “See”;

c) I shall consider phC (that is, phenomenal consciousness) a kind of operator by means of which $See(I^*, [p^*])$ becomes a *conscious* perception;

d) I shall indicate by “ $\rightarrow$ ” a cause-effect relation, by M the overall background of my mind (memories, wishes, intentions, beliefs, habits etc.) just before the execution of the action A , and by A my voluntary action to stop my car in front of the traffic light.

By means of these conventions (1) can be expressed as this philosophical reconstruction:

(2) $[p] \rightarrow ([phC(See(I^*, [p^*]))] \& M) \rightarrow A$

Let us reflect on the chain of causes and ef-

S. Nannini - Dipartimento di Scienze Sociali, Politiche e Cognitive, Università di Siena, Palazzo San Niccolò, via Roma, 56 - 53100 Siena (I)

E-mail: sandro.nannini@unisi.it (✉)



Creative Commons - Attribuzione - 4.0 Internazionale

facts that in (2) starts from the fact $[p]$ that the traffic light in front of me is red and ends with my action A of stopping my car. The fact $[p]$ and the action A are external states or events publicly observable and belong to the physical world. The ontological status of mental events enclosed in the box highlighted in gray, accessible only in part and only to me by introspection, is instead controversial but nowadays almost no one denies that all mental phenomena are correlated to brain processes.

Therefore, the causal chain described by (2) implies the existence of a corresponding causal chain of physical events ranging from $[p]$ (or better from the distal stimulus $[ds-p]$ (where $ds-p$ is the translation of p into physicalistic terms) to the motor response R (ontologically identical to A under a physical and neurological description) through the activities of my sense organs and my central nervous system, that is, through brain processes that are not publicly observable (or at least only very partially observable thanks to brain images whose acquisition requires sophisticated instrumentation). Therefore they too are highlighted in gray here:

$$(5) [ds-p] \rightarrow (\text{brain processes}) \rightarrow R$$

I recognize that there is an undeniable phenomenological gap between mental states and their neural correlates. But does this phenomenological gap imply an ontological gap as well?

Dualists say yes, physicalists instead say no. Those who, like me, want to defend the point of view of physicalism must be able to explain how it is possible to reduce the mental states described by (1) and (2) to the brain processes described by (5), although the former seem to have properties such as being conscious or having “intentionality” that the latter cannot have (at least *prima facie*).

To solve this problem I propose to introduce between (1) and (5) the intermediate statements (3) and (4):³

(1) *The traffic light in front of me is red, I see it*

and stop my car

$$(2) [p] \rightarrow ([phC(See(I^*, [p^*]))] \& M) \rightarrow A$$

$$(3) [p] \rightarrow ([fC(self-wise([p^*]-wise(q))) \& fM] \rightarrow A$$

$$(4) [ds-p] \rightarrow ([nm1(nm2(nm3(d))) \& B] \rightarrow R$$

$$(5) [ds-p] \rightarrow (\text{brain processes}) \rightarrow R$$

I have already examined (1) and (2). To switch from (2) to (3) I shall introduce the concept of functional reduction.⁴ Once the essential role played by a mental state in the economy of our minds and our behavior has been established, that state of mind can be reduced to the functional state (or states) of the brain that performs that function.

To detail, in (2) phC is a kind of operator that imposes the “format” of phenomenal consciousness, as it were, on my perception that the traffic light is red. Therefore, my conscious perception that the traffic light is red (main cause of A along with M) is considered in (2) as the nominalization of the propositional attitude expressed by $phC(See(I^*, [p^*]))$.

In (3) instead this propositional attitude is substituted by a functional state of my brain, that is, $[fC(self-wise([p^*]-wise(q)))]$. In other words, my perception that the traffic light is red is seen in (3) as a functional state of my brain defined by its causal role, that is, by its being an effect of $[p]$ in me and the essential contributory mental cause of my action A .

This substitution implies that by virtue of a double “adverbial transformation” I^* and $[p^*]$ cease to be the two terms of the relation “See” and are substituted by two adverbial operators (respectively *self-wise* and $[p^*]-wise$) that along with a third operator fC (that is, functional consciousness) modify the statement q (= “The traffic light is functionally seen to be red”).

Thanks to this functional reduction, “I see that the light is red” turns into “There is in my brain a (largely unknown) physicochemical process that can be described in the following functional terms: it is a kind of

“seeing” (that is, q) that, being caused by the presence of a red traffic light in front of me, is able to bring about the action A if it is modulated, while it is running from my retinas to the motor neurons of my right foot, in such a way that it becomes a “seeing” in a conscious (fC), subjective (*self-wise*) and “red-traffic-light way” ($[p^*]$ -wise).

The two terms I^* and $[p^*]$ of the propositional attitude obtain in its functional reduction as two ways of seeing. Moreover, the operator phC is replaced by the operator fC , that is, phenomenal consciousness is replaced by functional consciousness whereas M is substituted by its functional reduction fM .

More precisely, the phenomenal consciousness phC is a second order function of my brain’s dynamics that allows the activation of all those first order functions (such as sight and other senses, episodic memory, language, etc.) that can be activated only if I am awake and/or careful. Functional consciousness fC is instead the functional reduction of phenomenal consciousness.

If you compare phC to an application file with extension “.exe”, then fC describes the internal structure of phC as it appears when, instead of using it, we open it and read it as if it were a text file with extension “.doc”. In other words, phC is a symbol that represents the function of imposing the “first person format” on those processes of my brain that under this format become my conscious states. fC instead is an abbreviation for a description (unfortunately largely unknown so far) in functional terms (that is, in a third person format, for example by a flow chart or by a vector representation) of the internal structure of the first person format itself.

The transition from (3) to (4) is easy:

$$4) [ds-p] \rightarrow ([nm1(nm2(nm3(d))))] \& B \rightarrow R$$

In (4) $[ds-p]$ is a distal stimulus ontologically identical to $[p]$ re-described in physicalist terms. For example, let us substitute the red light emanating from the traffic light with electromagnetic waves having a length

comprised between 620 and 750 nanometers. Moreover let us assume that the complex functional brain state described in (3) by

$$([fC(\text{self-wise}([p^*]\text{-wise}(q))))] \& fM$$

is implemented by the dynamics of my brain that in (4) is described in the language of neuroscience by a sentence having this form:

$$[nm1(nm2(nm3(d))))] \& B$$

In this formula d is an abbreviation for the description in neurological terms of the brain dynamics that implement the functional state $[q]$. Analogously $nm1$, $nm2$, and $nm3$ are abbreviations for the description of the neurological implementation respectively of fC , *self-wise*, and $[p^*]$ -wise. In other words, $nm1$, $nm2$, and $nm3$ are similar to adverbial operators applied to d .

In other words, they represent in (4) the higher order properties of my brain’s dynamics that, thanks to the distributed release of some neurotransmitters, modulate the process of sensori-motor coordination in such a way that the perception of $[p]$ triggers the motor response R (according to the theory proposed by Edelman for the implementation of *qualia*). Moreover, B is the neural implementation of fM .

Finally, let us assume that the expression “*brain processes*” symbolizes a detailed neurological description of the brain activity whose dynamics are symbolized by $[nm1(nm2(nm3(d))))] \& B$.

Unfortunately this detailed and complete description of the brain processes that implement my mental states in a given moment is still largely unknown; nevertheless neuroscientists are able to give us a first sketch of this description.⁵

Thanks to these conventions (4) can transform into (5):

$$[ds-p] \rightarrow (\text{brain processes}) \rightarrow R$$

Therefore, it is correct to say that the

brain dynamics described by (4) *emerge* from the neural activity described by (5) and *retro-act* on it. As shown by Edelman, the activity of each neuronal group is directly or indirectly determined by the synaptic connections that it has with all other neuronal groups and helps to determine in turn their activity within a neural circuitry rich in reentry that makes the dynamics of the whole brain complex and unpredictable.

All of this gives a hint of how the mental states described by (1) and (2) can be ontologically reduced to the brain processes described by (4) and (5). Is this a solution to the *Hard Problem*? Not yet. However, it indicates the direction in which one must move to find such a solution. The role of (3) is decisive. For if for example the “seeing red” of (1) and (2) is reduced to the functional state “seeing redly” of (3) and furthermore it is assumed that my “seeing” is implemented by the dynamics $[d]$ of my brain, then it is easy to understand that my “seeing redly” can be implemented by $[nm3(d)]$, that is, by the dynamics $[d]$ if it is modulated by the release of certain neurotransmitters in the manner described by the operator $nm3$. Therefore (4) and (5) describe the neural implementation of the mental states described by (1) and (2) in so far as (3) offers a satisfactory functional reduction of such mental states.

But here the *Hard Problem* seems to re-surface again. The functional states mentioned in (3) correspond perfectly to the various characteristics of the brain dynamics described by (4): therefore, they are virtual states implemented without residue by corresponding processes in the brain. On the contrary, such a complete correspondence does not obtain between the mental states mentioned in (1) and (2) and the functional states mentioned in (3).

For example, the phenomenal and experiential format imposed by phC (=phenomenal consciousness) to my functional perception $[self-wise([p^*]-wise(q))]$ ensures that my functional perception transforms into my mental intentional state $[(See(I^*,[p^*]))]$. This implies

that a certain way of seeing, for example “seeing redly”, is represented as “seeing red”, that is, as the perception of a certain “phenomenal object”.

However, phenomenal objects seem to be irreducible to brain processes. Moreover, many mental states refer to objects that do not exist (for example, I have a hallucination or I am thinking of Zeus). Therefore, whereas it is easy to understand how a brain process that implements “seeing” or “thinking” can also implement a certain way of seeing or thinking (for example “seeing redly” or “thinking Zeus-wise”) if it is modulated in such a way that the implemented functional state and the implementing brain process are isomorphic, it is impossible that a physical process (such as a brain process) implements a phenomenal (and therefore non-physical or non-existent) object. It seems that emergentists (and dualists in general) have won the match!

But it is not so if we admit that *qualia* and other phenomenal entities or properties can legitimately appear at the level of analysis of folk psychology even if they are not completely implemented at the neurological level of analysis.

To obtain this it is sufficient to assume that all phenomenal entities or properties, qua contents of intentional mental states, are neither *illata* nor *abstracta* but *ficta*. *Ficta* are entities or properties which are spoken about as if they were real but in fact they do not exist. For example, in many physical laws entities, properties or processes obtain which strictly speaking do not exist. They are idealizations such as the ideal gases mentioned by thermodynamics. To be able to talk sensibly of *ficta* one must remember that because of their non-existence they are devoid of any causal power. If it seems that they have causal powers in fact such causal powers belong to the physically implemented “trick” that creates the illusion of their existence.

For example, when the brain processes that implement my conscious visual perception that the traffic light is red come into operation the irresistible illusion is generated in my

brain (and therefore in me) that in the real world there is such a property as the red color. In fact colors do not exist from a strictly physical point of view but the fact that the traffic light appears to me to be red is part of the activity of my brain that causes the movement of my right foot on my car's brake pedal.

Similarly, I am only the non-existent object "intentioned" by the content " I^* " of my perception [$See(I^*, [p^*])$] insofar as *nm2* (neural implementation of the functional state *self-wise*) has assumed the format of a conscious intentional mental state by means of which my brain, in order to improve my sensori-motor coordination, correlates the "complex scene"⁶ of which the red traffic light is a part with an idealized model of its own dynamics. Let us call (in functional terms) "*the Self*"⁷ the model by means of which the brain represents to itself this activity of sensori-motor coordination. This model is itself implemented by neural processes. But if these neural processes thanks to *nm1* assume the format of a conscious intentional mental representation I^* becomes (and therefore, as a conscious being, I become) its illusory content. If this is so, then I am a *fictum*.

Therefore, qua I^* I do not exist although I exist qua *Self*, that is, qua part of my brain's activity (or better I exist qua *self-wise*, that is, as the higher order property *nm2* of my brain's dynamics). The Cartesian "Cogito" is an illusion generated by my brain.

However, even if I *realize* that qua I^* I do not exist, I cannot help but *feel* that I exist. And it seems to me that I am the "sailor" of my body, not a servo-mechanism of my brain. Without this illusion I would not be able to live. Therefore, whether I admit or I do not admit that, strictly speaking, as the "sailor" of my body I do not exist in both cases nothing changes in my life from a practical and psychological point of view insofar as I feel that I exist and am the manager of my body.

Now, starting from this hypothesis as a solution to the Mind-Body Problem I am going to answer the questions and objections of my peer reviewers. Parrini gives me four sets of questions. First of all, I shall respond to

the questions put to me by him about the general problem of the relation between philosophy and science.

Parrini remarks that my metaphysical realism is not sufficiently justified from an epistemological point of view. Well, I agree with him that I am a metaphysical realist and that the epistemological dimension of the solution that I give to the Mind-Body Problem would need to be more thoroughly justified than I have done. Here I can only say, in a nutshell, that my realism, being naturalistic and physicalistic (as is clear in my scheme), is based on the Quinean "principle of continuity between science and philosophy".

Therefore, I think that I have to respect this interplay between science and philosophy imposed by the principle of continuity even with regard to the justification both of this principle itself and consequently also of realism. More in general, I think that if you accept the principle of continuity between science and philosophy then you cannot justify any philosophical choice in favor of any epistemological or metaphysical thesis by means of arguments *a priori*. Such a justification must always have an empirical basis.

Therefore, I think that metaphysical realism and the very principle of continuity between science and philosophy can be justified only pragmatically and retroactively thanks to the fact that these principles allow the formulation of a general worldview that is completely in agreement with all empirical data and promotes new and interesting scientific research projects.

I offer a similar answer to the second question that Parrini poses:

Do we have to deny any ground to the epistemological debate on the question of validity and justification, or also in his [that is, Nannini's] perspective does the articulation of Sellar's space of reasons still maintain some kind of value and meaning?⁸

Well, the normative dimension of episte-

mology retains its fundamental importance within my naturalism, provided that this is understood in a manner consistent with the aforementioned continuity between science and philosophy. As you cannot build a philosophical interdisciplinary ontology without taking into account the ontological commitments of the sciences, so you cannot even sketch the rules of a normative epistemology capable of judging the formal validity of scientific theories without taking into account the fact that these very scientific theories include criteria to assess both their substantive validity and their formal validity.

According to me, once Quine showed that the distinction between analytic judgments and synthetic judgments is not sustainable you can no longer distinguish between the empirical validity of a scientific theory (allegedly judged only by scientists) and its logical validity (allegedly judged only by philosophers). Scientists and philosophers must cooperate!

Now, let us come to the objections to my reductionism. Di Francesco & Tomasetta, Hörzer, Malhee & Stephan, and Parrini argue, albeit in different forms, that I deny, in a completely implausible manner, the existence of phenomenal consciousness, the Self (I prefer to say the *I*), and free will.⁹

To respond to this objection I prefer to refer to my scheme. In this scheme, consciousness appears under three distinct descriptions:

- a) as brain consciousness (that is, as *nm1*, a higher order property of brain dynamics) in (4);
- b) as functional consciousness (that is, as *fC*) in (3);
- c) as phenomenal consciousness (that is, as *phC*) in (2) and (1) (I repeat that (2) expresses explicitly what is implicit in (1)).

Brain consciousness is real since it is a physical property of the brain activity which implements both functional consciousness

and phenomenal consciousness. In other words, neuroscientists try to describe and explain brain activity by means of their neurological theories, cognitive psychologists offer a second description and explanation of the same phenomena in functional terms whereas the very brain gives to itself a third description of its own activity, as it were, in the format of intentionality and “first person”.

Therefore, according to me, physicalistic eliminativism, if properly understood, does not eliminate consciousness. In my scheme phenomenal consciousness (*phC*), insofar as it is implemented by *nm1*, is real but is neither a non-physical substance nor a non-physical property. It is rather a “machine code” of the brain (or, changing the metaphor, its servomechanism) that gives a certain format to some brain processes by synchronizing them (and by using other “computer tricks” not fully known so far). Thanks to this format some brain processes become conscious states, that is, they become able to exchange their respective contents with each other.

The ontological status of the *I* and free will, one of its essential properties, is different. In fact the *I* and its free will are not real, they are *ficta*. But not all concepts of *ficta* are equally acceptable in scientific theories. Some of them are concepts of speculative philosophy and theology (such as the concept of soul) that have no function in any scientific theory.

The *I* instead, although non-existent strictly speaking, is nevertheless the “intentional object” of a mental representation constructed by my brain in order to represent as an *I** its own neural *Self* (that is, the coordinated activity of all its processes (= *nm2*)).

Therefore, though the *I* is non-existent (that is, strictly speaking, I do not exist!) and is devoid of any direct causal powers, the fact that my brain represents to itself its own *Self*⁰ as an *I** (thanks to the format *phC* (that is, *nm1*) given to its representation) causally contributes to the realization of *R*. Thanks to *nm1* (that is, the brain consciousness that implements phenomenal consciousness), the

information contained in *nm2* is “seen” by my brain as an *I**; and it is only in this format that this information becomes accessible to all processes of my brain. In a similar way free will too, despite its being a *factum*, contributes through its partial and tricky neural implementation (included in *nm2*) to give to the activity of the brain of human beings the flexibility and unpredictability that is typical of their voluntary actions.

To sum up, phenomenal consciousness qua ontologically identical to a higher order property of brain dynamics is not illusory. It is instead an illusion that I exist as a mind distinguishable from my body and I am an agent gifted with free will in a Cartesian sense.

But here – as Maleeh & Stephan rightly ask – I must clarify what is an illusion.¹¹ For example – thereby I answer too the questions of Parrini, Di Francesco & Tomasetta with regard to the reality of free will – when I execute a voluntary action I feel that it is me who is acting. While I am voluntarily doing something I feel a sentiment of agency that is also a sentiment of freedom. That sentiment is real and coincides with a certain set of brain processes that are part of the neural *Self*. But such processes can have effects on my behavior only because of their having assumed the format of consciousness and intentionality.

Under that format they are “read” by other brain processes as mental representations whose content includes the information: “I am a free agent”. This *content*, that is, my being gifted with free will in the Cartesian and libertarian meaning spontaneously accepted by common sense is illusory (since I feel free but in fact I am not free). However, my *sentiment* of free will is real since it is implemented by some brain processes that contribute to giving my brain (and therefore me) finer control of my body’s movements.

All my peer reviewers oppose an antireductionistic conception of the mental to my reductionistic solution of the Mind-Body Problem which identifies phenomenal consciousness with brain consciousness from an ontological point of view.

The peer reviewer closest to my position is Roth. However, he too says that physicalistic reductionism is not the only possible explanation of the constant correlation between mental states and brain processes. Roth uses the Kantian distinction between “phenomenon” and “noumenon” to distinguish the “real” (= noumenal) brain from the “actual” (= phenomenal) brain. According to Roth, we know thanks to neurosciences only the actual brain. But consciousness is produced by the real brain of which we know nothing. Therefore, we do not know how consciousness emerges from the activity of the real brain.

This neo-mysterian conclusion is corrected only in part at the end of Roth’s comment when he admits that

since in our “actuality” [that is, phenomenal world] we empirically and consistently discover that some brain states give rise to conscious mental states, it is most reasonable (although can never be proven objectively) that under very specific circumstances “real” neurons possess the ability to produce consciousness as the basis of our actuality.¹²

My scheme offers a reconstruction of Roth’s position that retains its substance but avoids its neo-mysterianism. According to me, the real brain must be identified by default, as it were (because of the principle of continuity between science and philosophy), with the brain studied by neurosciences. Therefore, our knowledge of the real brain will be identical to our knowledge of the brain offered by neurosciences.

From this perspective, if you look at my scheme you see that the real physical brain (the only existent brain studied by neurosciences) thanks to its activities (described in (4) and (5)) “constructs” in a mysterious way neither [*p**] nor any other phenomenal object. It “constructs” (or better implements) by quite normal neural processes a perception whose content (= phenomenal object) is the

fictum [p^*]. My brain deludes itself (and therefore me insofar as, qua *Self*, I am a part of my brain's activity) by believing (and letting me believe) that the "real" (= physical) state of affairs [p] has the same features as the "actual" (= phenomenal) [p^*].

This illusion, insofar as it coincides with my perception of [p], is real in a physical sense because it is implemented by brain processes and is essential to cause R (and therefore A) qua appropriate motor response to my being in the presence of [p]. Its content [p^*] qua phenomenal object is instead non-existent. Therefore it has effects on my behavior not as a phenomenal *object* but as a *way* of modulating the neural activity that implements my perception. Qua phenomenal object [p^*] has no causal power.

Now, after having replied to Roth let me come back to the criticisms addressed by my other peer reviewers against my physicalistic and eliminativistic reductionism. Parrini in the first part of his third question wonders whether my reductionism does not neglect an analysis of phenomenal consciousness *juxta propria principia*. A similar criticism against any physicalistic and reductionist approach that (allegedly) neglects the heterogeneity of phenomenal consciousness with respect to its neural correlates is at the basis of Maleeh & Stephan's emergentism, of Di Francesco & Tomasetta's non-reductionism, and of the criticism addressed to me by Hörzer that my cognitive naturalism is not able to account for the phenomenal feel of conscious states.

Well, in my scheme I do not deny the existence of a phenomenological gap between the brain processes described by (4) and (5) and the states of consciousness mentioned in (1) and (2). I deny only that such a phenomenological gap implies an ontological gap as well.

Furthermore (2) is, at least in my intentions, a philosophical reconstruction of (1) *juxta propria principia* and is a fundamental intermediate step to functionally reduce (1) to (3). Therefore, I do admit a phenomenological gap between phenomenal consciousness and brain processes and emphasize that

in (1) and (2) entities and properties are mentioned (I have called them *ficta*) that are devoid of any proper physical implementation in (4) and (5).

What separates me from my peer reviewers is not the existence of such a phenomenological gap but the idea that if I speak of phenomenal consciousness' features as not reducible to properties of brain dynamics, then I should be obliged to accept mind-brain interactionistic dualism. According to me, the acceptance of such a dualism becomes unavoidable only if the non reducible phenomenal features of consciousness are seen not as *ficta* but as non-physical real properties gifted with causal powers.

However, what kind of interactionistic dualism is the object of my rejection? Only Cartesian dualism (that is, the dualism of substances) or even the dualism of properties, including emergentism?

Di Francesco & Tomasetta note that in certain passages of my paper it seems that I identify all forms of anti-reductionism with Cartesian dualism, that is, a dualism in which the mind is an immaterial spiritual substance in principle separable from the body. If I gave the impression of reducing all forms of anti-reductionism to Cartesian dualism I must correct myself. I do not deny the possibility of other forms of anti-reductionism, such as, in particular, Maleeh & Stephan's emergentism (called by them also "dualistic naturalism" or "property dualism"), which consider consciousness as a property that emerges from the activity of the brain and is able to causally retro-act on it. I admit too that the empirical data that support emergentism largely (but not completely!) coincide with those that underpin my reductionism.

Moreover, with regard to the emergence of consciousness from the activity of the brain I do claim, indeed, that in my scheme phenomenal consciousness (*phC*), insofar as it is ontologically reducible to the brain consciousness (*nm1*) described in (4), emerges from the brain processes described in (5) and is able to causally feedback on them. So far I

agree with emergentism. However, I remark that emergentists usually confuse the causal interaction between (5) and (4) with the transformation of (4) in (2) (and thus (1)) through (3).

The former is a causal interaction that obtains in all complex physical systems between the local properties of the single elements of the system and the systemic properties that emerge from their relations. The latter is a “recoding process” that makes it possible that the brain presents to itself certain higher order properties of its own dynamics as if they were the contents of ontologically separated intentional mental states. This recoding that is responsible for the appearance of mental *ficta* irreducible to the dynamics of the brain does not produce the emergence of anything from the ontological point of view! It is just a change of format!

On the contrary there is a real emergence and subsequent causal interaction between the brain processes described by (5) and the higher order properties of brain dynamics described by (4). However, since (4) and (5) both belong to the neurological level of analysis brain consciousness can causally react on the activity of single neurons without violating the “closure of the physical world” (in particular the energy conservation principle) or assuming very controversial hypotheses drawn from micro-physics (see, i.e., J.C. Eccles, R. Penrose, D. Chalmers).

So I think that Maleeh & Stephan are wrong when they claim that

naturalistic dualism, as a sort of property dualism, is also as scientific as eliminativism and no experimentation can confirm one thesis over the other.¹³

It is not so! Any form of interactionistic dualism – no matter if it is a dualism of substances or a dualism of properties – that sees consciousness as a real non-physical entity or as a real non-physical property and at the same time gives it the power to feed back on the physical basis from which it emerges nec-

essarily violates the principle of closure of the physical world and therefore the principle of conservation of energy as well.

If you want to avoid such a violation of a fundamental principle of physics but at the same time you want to continue to be an emergentist (of course without denying or making mysterious the constant correlation that exists between brain processes and mental states) you have only two possibilities: you must accept either epiphenomenalism or “parallelism” between mind and body. But epiphenomenalism is biologically implausible. Therefore, the only reasonable choice is parallelism accompanied by “neutral monism”: the mental and the bodily are two properties of an underpinning “neutral” substance.

Parrini, Di Francesco & Tomasetta, and Maleeh & Stephan also nod sympathetically at neutral monism. I do not have the space here to give neutral monism the attention it merits especially in the version recently proposed by D. Chalmers. However, it seems to me that neutral monism is a theory that explains *obscurum per obscurius* (we have no idea what this neutral substance might be!) and has panpsychistic implications which are much more counter-intuitive than the implications of my physicalistic and reductionist naturalism.

However, I admit that my hypothesis too is strongly counter-intuitive. Therefore, I understand why my peer reviewers (except perhaps Roth) object that I overestimate the achievements of neuroscience (Di Francesco & Tomasetta) and renounce a “manifest image” of the mind in favor of a “scientific image” of it too hastily considered by me as superior instead of trying to reconcile the two images (Parrini, Maleeh & Stephan).

What can I reply? Well, I admit that I am a bit “scientistic”. But I don’t think that this is a serious fault! Joking aside, if I were a non-physical thing or a non-physical property I could not voluntarily cause any movement of my body without violating a fundamental principle of physics like the principle of conservation of energy.

On the contrary, if I am, qua *Self*, a higher

order property of my brain's dynamics then it is not only easily understandable how I can control the movements of my body but it becomes possible by combining A. Einstein and E. Pöppel to comprehend that the very brain activity of which I am really a part makes it possible for me to have the false impression that I am on the contrary its external "sailor". But I do not repeat here what I have already written in my paper about this point.

Moreover – and this is the second cue that I have tried to draw from Pöppel and other neuroscientists – if both the perception of time and the stream of consciousness require, to be realized, the same neural synchronization we can guess, perhaps, that the feeling of been dragged along by time and the feeling of being awake and careful basically coincide and are implemented by the same higher order property of brain dynamics. If so then perceiving the passage of time is the basic format of any possible state of consciousness: Kant had a point! But of course this does not bring research on what consciousness is to an end. On the contrary, it enables this research to develop on a new basis.

Notes

¹ G.M. HÖRZER, *Cognitive Naturalism and the Phenomenal Feel*, in: «Rivista Internazionale di Filosofia e Psicologia», vol. VI, n. 3, 2015, pp. 492-496, here p. 493.

² More generally, thanks to a process of nominalization I represent by [...] the fact described by the statement "...".

³ A hint in this direction is offered by physics. The reduction of the temperature of a gas to the measure of its molecules' average kinetic energy shows how a concept of thermology like temperature can be reduced to a concept of classical mechanics like energy through the mediation of an intermediate level of analysis such as that offered by thermodynamics.

⁴ I take this concept from Kim (see J. KIM, *Mind in a Physical World*, MIT Press, Cambridge (MA) 1998; J. KIM, *Physicalism, or Something Near Enough*, Princeton University Press, Princeton 2005) but I do not share his thesis that phenomenal consciousness is not functionally reducible and therefore it is an epiphenomenon (see J. KIM, *Philosophy of Mind*, Westview Press, Boulder 1996). Here and in all other cases of a bibliographic reference see the list of references for my paper.

⁵ See G. EDELMAN, *Wider than the Sky: The Phenomenal Gift of Consciousness*, Yale University Press, New Haven 2004.

⁶ See *ivi*.

⁷ In order to respond more clearly to my peer reviewers in these replies, and differing from what I have done in my paper, I refer here only to the "neural self" as part of brain activity by using the expression "*the Self*". To refer to myself in common sense I use instead the expression "*I*".

⁸ P. PARRINI, *Time and Consciousness in Cognitive Naturalism: Four Questions*, in: «Rivista Internazionale di Filosofia e Psicologia», vol. VI, n. 3, 2015, pp. 474-479, here p. 477.

⁹ M. DI FRANCESCO, A. TOMASETTA, *Analogies, Non-reductionism, and Illusion*, in: «Rivista Internazionale di Filosofia e Psicologia», pp. 480-485, here pp. 482-483; G.M. HÖRZER, *Cognitive Naturalism and the Phenomenal Feel*, cit., p. 494-495; R. MALEEH, A. STEPHAN, *Consciousness: Emergent and Real*, in: «Rivista Internazionale di Filosofia e Psicologia», pp. 486-491, here, p. 489-490; P. PARRINI, *Time and Consciousness in Cognitive Naturalism: Four Questions*, cit., p. 478.

¹⁰ The *Self* is more exactly mentioned in my scheme as the higher order property "*self-wise*" under a functional description and as *nm2* under a neurological description.

¹¹ See R. MALEEH, A. STEPHAN, *Consciousness: Emergent and Real*, cit., p. 490.

¹² See G. ROTH, *The "Material" and the "Mental" as Brain Constructs*, in: «Rivista Internazionale di Filosofia e Psicologia», vol. VI, n. 3, 2015, pp. 497-503, here p. 502.

¹³ See R. MALEEH, A. STEPHAN, *Consciousness: Emergent and Real*, cit., p. 488.