Article

The Emergent Structure of Consciousness (Part II)

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Abstract

Current day Physics and Science in general are based on a computational quantitative-reductionist approach that even though highly successful, they not only still leave consciousness out, but they don't appear to offer any key of how consciousness is even supposed to be integrated into the current scientific establishment. This delay of integrating consciousness into Science starts to suggest that the current approaches might not be the most suitable tools of tackling consciousness. Therefore, in this paper, an approach that would be in contrast to current Science, but ending by subsuming it, would be employed in analyzing consciousness. Consciousness would be shown to be an emergent phenomenon that would show a consistent structure throughout, and in this structure, suggestions for integrating current Physics would be made.

Part II of this two-part article includes: Physics; Quantum Mechanics; The mind-body problem; Theory of Relativity; The idealist ontology; The Future of Physics and Science; Powers of the agency; Computation out of non-computational elements; Conclusions; and References.

Keywords: Consciousness, emergent structure, physics, science, computational, integration.

Physics

We went a long way of exposing the emergent structure of consciousness. Is it complete? It surely is not. The true structure might be made out of hundreds of levels and an attempt to uncover them all is well beyond the purposes of this paper. What the main purposes of this paper are is to reveal the main levels of the hierarchy and also make sure that those levels allow some kind of integration of Physics into consciousness. I think that the most important lesson that the above presentation is teaching us is that even though there might be entities outside of consciousness, the fact that consciousness has an emergent structure, great restrictions are to be applied to whatever might be outside consciousness. Note that since existence is a quality of the Self, a quality which because of its self-referential nature is ontological subjective, to say that something exists is to say that that something is a consciousness. So, there can be nothing outside consciousness. Nevertheless, because we still have the appearance of an external physical world, we would go ahead with this assumption that the physical world exists in a vague sense, but later on we will give up completely on it and we will present a fully subjective ontology for the world. I think that although the details of the presentation can be adjusted, the fact that consciousness is indeed structured in an emergent fashion is an almost certain fact.

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I don't see in what other form the analysis that I did can be casted such as to make emergence just an illusion. I don't see how color red can be predicted from black-and-white or how the rabbit can be predicted from the mere shape of the duck-rabbit image. I don't see how music can be predicted from just uttering sounds and I don't see how I would ever understand Chinese just by looking at the shapes of the Chinese characters. So, the almost certainty of emergence cast serious doubts on having a totally different domain of reality that is different in nature from the emergent nature of consciousness. Physics, though still apparently computational (exception the collapse of the wavefunction), cannot be truly like this on its most fundamental levels, especially since our brains appears to also be made out of entities that are tackled by current-day Physics. If consciousness has anything to do with the brain, and if Physics also has anything to do with the brain, then the straightforward conclusion is that Physics needs to also be structured in an emergent way.

We will first start from some empirical facts and then we will go into details showing how those facts are part of the emergent structure of consciousness. We will first talk about Quantum Mechanics because to a certain degree it will still maintain the solipsistic analysis, but then from careful considerations from what Quantum Mechanics will imply, we will generalize to the existence of many consciousnesses in the world and we will show how this imply the Theory of Relativity. This way, the unification between Quantum Mechanics and Theory of Relativity will be realized. It will be seen that this unification is done through the emergent structure of consciousness, being a qualitative unification, no mathematical unification being possible.

Quantum Mechanics

As our conclusion about the structure of Physics was that it needs to be emergent, this should be the first element that we should be looking for in the present-day Physics. Does it present anything that might resemble emergence? There is indeed something in present-day Quantum Mechanics, but we would need to be careful how to treat it from an emergent point of view. That something is the famous collapse of the wavefunction that presents a non-computational nature. It is used for example in the Orch-OR theory of Roger Penrose and Stuart Hameroff to argue that since consciousness is non-computational and the collapse of the wavefunction is also non-computational, that must be the moment when consciousness takes place, this objective reduction being orchestrated in the microtubules in the brain by slight displacements of mass as to select the proper qualia to be presented to consciousness, qualia which are embedded in space-time [11]. This is obviously a far-fetched connection. We will also start from the collapse of the wavefunction, but the connection that we are going to make will be one much strongly in correspondence with the above emergent structure of consciousness.

Another notable attempt of making a connection between consciousness and Quantum Mechanics is Donald Hoffman's theory of conscious realism where he starts from the fact that consciousness is all there is, and by defining the notion of "conscious agent", he then goes to show that by the way conscious agents interact their interactions respect the unity of consciousness (2 conscious agents can unite into one conscious agent) and also that the wavefunction of the free particle can be derived by identification between the variables used in the Mathematics of the interacting conscious agents and the physical variables used in the

wavefunction of the free particle [12]. The problem with this theory, problem also shared by Orch-OR is that both take all qualia to be on the same level of the hierarchy.

This lack of awareness with regard to the fact that qualia are actually disposed on a variety of levels of a hierarchy I believe is an obstacle that will render limited any attempt of connecting consciousness to Quantum Mechanics. Orch-OR talks right about consciousness being non-computational, but fails to see that this non-computability is not only of 1 type that all qualia share, but that this non-computability takes place at each step from one level to the next one. There is nothing that predicts colors from black-and-white, there is nothing that predicts shapes from color, etc. So, talking about the collapse of the wavefunction as being a unique point of connection between Quantum Mechanics and any qualia cannot be correct. As there are many places of non-computable steps in the emergent hierarchy, the collapse of the wavefunction can at most be connected to only one of the steps of the emergent hierarchy. And indeed, this will be the point that we will make, Quantum Mechanics coming into consciousness through the collapse of the wavefunction only at one specific point, leaving all the other levels of consciousness to belong strictly to consciousness.

Having these said, let's look for the emergent flavor that quantum phenomena might display. We will take the simplest experiment in Quantum Mechanics and have a look at what we might see. Notice that at this moment we are not invoking any quantum theory, we are just looking at phenomena, as they are being displayed in experiments. The simplest experiment is the double-slit experiment. Empirically we observe that when we fire particles one by one at a double-slit, they hit the screen on points that in time start to display a certain pattern. But this suspiciously resembles a kind of emergent behavior. It appears that even though we fire individual particles, the points on the screen on which each particle arrives are influenced by something bigger than themselves, the particles losing their individual trajectories that we were expecting from them from a classical point of view. So there appears that 2 entities are involved in this phenomenon: first, there is the individual point at which a particle hits the screen, and second there is the pattern that appears after many number of individual hits.

Are we just looking at an emergent phenomenon that is displaying 2 of its levels? Let's check the properties of emergence, see if they apply here. According to emergence, the higher level should not be predictable from the lower level. If we look at this phenomenon, we indeed see that we cannot predict the pattern from an individual hit. There is nothing in an individual hit that could ever predict what the pattern will be. Let's check the second property. Is the pattern reducible to a hit? As we can clearly see, it is not: the pattern is a spatially extended entity with a certain shape, while the hits are only shapeless point-like. So, there seems to be strong suggestions that we are facing an emergent phenomenon. Of course, since emergence is a property of consciousness, we need to find a way to properly look at the results from the double-slit experiment as to integrate them into consciousness. As we will see, the integration will not be as straightforward as might be assumed at this point. Before going to the next step of finding a way for integration, let's stay a little longer on the double-slit experiment and make another interesting analogy that will strengthen our assumptions that we are facing an emergent phenomenon.

One question, at this phenomenological level that we are at the moment, is: "How do the particles know where to get on the screen, how do they gather such as to form the pattern?". Do we have something similar in the phenomenology of consciousness? Indeed we have, and that is the example that we gave about how the intention of writing a sentence makes the words to take their proper positions in the sentence and the letters to take the proper positions in the words such that the highest level of the sentence is a unified meaningful entity. From a phenomenological point of view, the pattern of the double-slit and the formation of a sentence appears to be the same kind of phenomenon. So, if indeed they are the same kind of phenomenon, then it means that the positions on the screen of each particle are influenced by the level of the pattern. A physicist might ask at this moment: "Does this mean that the pattern has a physical existence in the same way that the positions of each particle have a physical existence?". The answer is that this question is wrongly posed. The pattern doesn't have a "physical" existence, since the physical world doesn't exist. But what the pattern does indeed have, is an intrinsic quality in consciousness, and its appearance on the screen is a shadow of that quality (as per the title of Roger Penrose's book: "Shadows of the Mind"). What exactly this means we will see later on when we will search for what that quality actually is. But in short, in Thomas Nagel's words, there is something-it-is-like to be the pattern [13].

We thus see that the phenomenology of the double-slit experiment follows in multiple ways the phenomenology of emergence of consciousness. Some might object at this moment that also the throwing of a ball into the air follows the properties of emergence, each position of the ball in the air cannot predicting the parabolic pattern that it follows, and the parabolic pattern cannot be reduced to an individual position. And strictly phenomenologically, this objection is correct. That's why, our next step in finding the emergent character of Quantum Mechanics is to go to the quantum theory. A caution that we need to raise here is that the integration of Quantum Mechanics into consciousness that we are going to make is based completely on quantum theory. If quantum theory is incorrect in the way it is being expressed conceptually, then also our integration will have to be reconsidered into the future.

But since quantum theory is the best tool that our current Science has in dealing with the material world, it is the only thing that we can use. This is a general way of how Science works: the best tools that are available at any one moment of time are used to advance Science further. We can only hope that the essence of how matter behaves at the quantum scales has been successfully captured by present-day quantum theory.

When trying to come up with a mathematical formalism for the observed quantum phenomena, it turned out that people came up with a formalism that is composed out of 2 parts: the wavefunction and the probabilities. It turns out that a quantum system can be described computationally through a wavefunction that represents the state of a system. But then, when a measurement is done to actually obtain information about the system, the individual results obtained cannot be predicted in any way from the wavefunction. All that can be obtained are probabilities that each eigenvalue contained in the wavefunction of the system can take. Probabilities are connected to the wavefunction and can be predicted from it through the ad-hoc Born's rule.

There is nothing in the wavefunction as such that even suggest that by measuring it, probabilities would be obtained. Born's rule is just a lucky empirical fact that turned out successful in explaining the results of the measurements by relating them to the wavefunction that describes the system that is being measured. The mathematical structure of the wavefunction has nothing to do with the probabilities that are obtained at measurement. If someone would be given just the Mathematics of the wavefunction, that person would have no way of making any prediction of what the results of a measurement would be. This starts to suggest an emergent behavior. From the level of the wavefunction, the level of probabilities cannot be predicted. And also, the level of probabilities cannot be reduced to the level of the wavefunction. This is because probabilities are just numbers between 0% and 100% and this has nothing to do with the Mathematics of the wavefunction.

In case someone might argue that this is not true, that Born's rule actually allows the predictions to be made, notice that what emergence says is that from a current level, the next level cannot be predicted. In our case, the current level is the level of the wavefunction. And this level doesn't have anything in it that might predict the emergence of probabilities. This doesn't happen for the ball thrown into the air. In that case, the parabolic shape can be predicted because the parabolic shape takes place in the mathematical framework of Classical Mechanics, so in that case the parabolic shape is not another level that somehow emerges from Classical Mechanics. The shape is contained within the Mathematics of Classical Mechanics. In the case of Quantum Mechanics on the other hand, there are 2 totally distinct mathematical frameworks that make up quantum theory: the wavefunction and the probabilities, which are connected strictly empirically, with no theoretical justification, by Born's rule.

Starting from these considerations of Quantum Mechanics, in what follows we will take some great leaps of faith in finding a way of integrating Quantum Mechanics into consciousness. As I also warned the reader in the section about the retentional passage of time, beside that section, this is the second difficult part of the paper. While the understanding of the retentional passage of time I consider to be difficult because of its subtle phenomenological aspects that might not be found in the introspection of the reader, this part I consider to be difficult because the leaps of faith that we will employ. But given the state of the current efforts of mankind of finding a theory of consciousness, I think that such leaps of faith are excusable. Nevertheless, after the leaps are going to be taken, efforts will be put into arguing why they might be correct. The final picture that this paper will lead to, I hope will be an overall satisfying one, such that the shaky intermediary steps that will lead there will be appreciated more and will be seen as harmonious parts of the greater picture. These being said, let's see what we can do to bring Quantum Mechanics into consciousness.

The identification of the emergent levels present in Quantum Mechanics that we are going to make is the ones that are being exposed by the quantum theory. One is the level of the wavefunction that is a superposition of the eigenvalues of a system, and the second one is the level of the probabilities that each eigenvalue takes at the moment of measurement. Given the eigenvalues of a system, no probabilities can be predicted from the wavefunction that describes the system, and the probabilities cannot be reduced to the eigenvalues: given just the values of the probabilities, nothing can be said about what they represent. To understand better how exactly we chose to view the level of probabilities, let's remember another property of

emergence that we discussed: the property of multiple realizability. There we gave as an example how the quale of a rabbit can be obtained either from the shape of a black-and-white sketch or from the shape of a colored photography.

Here we see also this property of emergence. We can have different quantum systems, for example one that has as eigenvalues positions for a particle, one that has as eigenvalues spins for a particle. Let's say that the systems are such that when making the measurements, similar values for probabilities would be obtained. For example, for the first system we could have: position A 30%, position B 70%, and for the second system we could have: spin X 30%, spin Y 70%. The eigenvalues represent different physical entities, in the same way that in the above example we have a black-and-white shape and a colored shape, while the probabilities are the same for each system, in the same way that both shapes emerge a rabbit. This gives a better clarification about what we take the level of probabilities to be: just a set of numbers between 0% and 100%, with no physical baggage whatsoever. And this level of pure numbers emerges from a level of physical entities such as positions or spins. The importance of this way of looking at the level of probabilities will be seen at our final step of integrating Quantum Mechanics into consciousness. For the moment, what needs to be understood is that the levels that we suspect to be emergent are the level of the eigenvalues of a system, which represents physical entities such as positions or spins, and the level of probabilities with which the eigenvalues of the system show up in measurements, which are pure numbers between 0% and 100%.

Now that we identified more precisely what actually are the levels that we consider to be emergent, we are one step away from integration. Because emergence is a property of consciousness, we will need to see how to take these levels that at this moment are still ontologically objective and make them ontologically subjective, showing thus that there is no physical world, but only consciousness. Before taking the last step, it is good to bring yet some more justifications that what we are doing is correct. Maybe the way forward for Physics doesn't even have to ever do with consciousness. So is good to bring some more arguments that Physics cannot move forward without becoming a science of consciousness. Because of Physics's current materialist status, we will present the arguments as for the standard materialist reader that believes that the progress of Physics will forever be done through Mathematics.

Justifications for integrating Quantum Mechanics into consciousness

1) Given the extraordinary precision of Quantum Mechanics, it is unlikely that the progress will come by formulating an even more precise mathematical theory, as for example one that will encompass both Quantum Mechanics and General Relativity and will make new and even more precise predictions. More likely is that the mathematical structure of Quantum Mechanics has already been discovered, so the only way forward remains the way of emergence, which will bring new elements into the world, while leaving intact current Quantum Mechanics. This is similar to how an image leaves intact the colors that it contains while at the same time being more than the sum of its colors.

2) The world contains consciousness, so there are utterly different qualitative elements of reality that have nothing to do with Mathematics. Therefore, there is no possibility of mathematically extending Quantum Mechanics such as to contain the radically different qualitative entities of

consciousness. These entities can only be encompassed through emergence: they are levels of reality qualitatively different from the levels from which they emerge.

3) The way in which probabilities emerge from eigenvalues is identical to the way in which complex qualia emerge from simpler qualia in consciousness. Therefore, there are clues that Quantum Mechanics is actually an emergent theory and that its emergent structure might be part of the emergent structure of consciousness.

4) Consciousness moves the body. So, there must be a way for the intentions in consciousness to influence the physical world. Quantum Mechanics offers just such a place by its indeterminist collapse of the wavefunction.

Given these justifications I think that it is quite clear that the only way forward must be through consciousness. So, instead of finding a mathematical extension of Physics that would describe the qualitative aspects of consciousness, a more natural approach is to find the qualities of Physics that allows it to be considered part of consciousness. With these in mind, is time to make the next and final step of integrating Quantum Mechanics into consciousness. We already made the suggestion that Quantum Mechanics has an emergent structure made up of 2 levels. What we thus need to find is some qualities for these levels as to see them as part of consciousness. As far as I can see, I only have one suggestion of such a quality, therefore I will only integrate one of the levels. But for the purposes of this paper, this is enough, showing a way of how Physics can proceed in the future by identifying qualities that can be seen as part of consciousness. The level that I will integrate is the level of probabilities.

If we look closely at it and try to find what quality it might have, what we observe is that this level contains numbers from 0% to 100%. Of course, the qualities that such numbers might suggest might be many. But we should try and find a quality that be in accordance with the emergent structure of consciousness presented in this paper. From all the levels presented, what might be the one that mostly matches the level of probabilities? In my opinion, this is the level of diversity. The numbers that the level of probabilities can take suggest to me a variety of numbers, so it suggests to me that the probabilities level has a quality of diversity. So, the probabilities present in Quantum Mechanics are likely to actually be the level of diversity from consciousness. To visualize what this might mean, I'll give the following example: When you look on the window and you see all the people on the streets and all the trees and all the buildings, what you are actually doing is to experience the level of probabilities from Quantum Mechanics. This doesn't mean that any collapse of the wavefunction takes place. What it means is that the level of probabilities being the level of diversity, it just contributes with its quality of diversity to the higher levels qualia. I admit, this is nothing more than a guess. But is an educated guess based on the entire presentation done in this paper. And a guess based on which a coherent ontology will be next developed. Until all the pieces of the puzzle will be set in place, the reader will get a feeling that the next pages will be quite chaotic, many elements coming into play with apparently no connection between them. But as we will settle more pieces of the puzzle, the final picture will turn out to have a rather aesthetically pleasant look.

The mind-body problem

As this identification is definitely a bold step to make, we have to support it somehow. There will be many arguments for why this identification between probabilities and diversity is likely a good one, the paper hopefully ending up by making this identification a rather natural one. Let's bring here the first argument to support this idea. This argument will be at this moment a materialist-idealist mix, following that future analysis will make it entirely idealistic. The argument is the fact that consciousness moves the body. The mind-body problem is with us since immemorial times, resisting any attempt for a solution. Its first cast in modern terms was done by Descartes, together with a solution for how this is done: the soul is connected to the body through the pineal gland and it moves the body through the mediation of animal spirits [14]. Can we find a better solution today? I will argue that Quantum Mechanics offers this finally awaited step in connecting the mind to the body.

Of course, since we are working under the paradigm that consciousness is all there is, we will later on show how the body is only an appearance, no interaction actually taking place between consciousness and the body, but that all interactions are between consciousnesses. But we will take one step at a time. For the moment, we will see what tools Quantum Mechanics offers us in order to solve the mind-body problem. Quantum Mechanics freeing itself from determinism, leaves open a door for other forces to come in and influence the world. Of course, the way Quantum Mechanics is regarded today, it only replaced determinism by random indeterminism. But because of the ad-hoc Born's rule, the randomness of indeterminism is not grounded in any theoretical framework, so it is an indeterminism that leaves open future advancements of science that will replace Born's rule by other causal influences upon the values obtained at the moment of measurement.

Recent experiments by Dean Radin suggest exactly this. In his experiments, volunteers were asked to concentrate upon the slit through which a particle is travelling through the double-slit. Of course, the formalism of Quantum Mechanics doesn't say anything about a particle travelling through one or the other slit, its formalism being about superposition. Nevertheless, by doing such thinking, the volunteers influenced the results obtained in the double-slit. The influences were even more increased when professional meditators concentrated upon the double-slit [15]. This suggests that indeed the indeterminism of Quantum Mechanics is not fundamentally random, but is open up for influences from outside, as for example from consciousnesses.

So, the way consciousness moves the body is probably through the level of probabilities. We know from biology that at the moment when we decide to move the body, certain electro-chemical reactions are taking place in the brain that send electrical currents to the muscles in order to execute the desired movement. So, the intention to move the body must initiate something in the brain. Given present-day Quantum Mechanics, this suggests that what the intention in consciousness to move the body does, is to collapse the wavefunction of certain specialized brain regions to specific eigenvalues for the positions of the electrons for example, such that those positions on which the electrons collapse will lead to certain precise movements of the body that will be in correspondence with the intention in consciousness. Maybe the true mechanism is different than this one, but given present-day science, this is the only way that I

can see for consciousness to act upon the body. This mechanism even has the advantage of not contradicting in any way the mathematical structure of the wavefunction.

Quantum Mechanics stays the same. The only element that changes is Born's rule, which is anyway just an ad-hoc element of present quantum theory. And the best part of this mechanism is that it is in perfect agreement with the emergent nature of consciousness. In emergence, higher levels don't destroy the lower levels, they just rearrange them in order for the higher level to bring meaning over and above the meanings of the lower levels. When I see an image, the colors in the image are not changed in themselves. They are just rearranged as to take part in the bigger whole. When I write a sentence, the words are not changed, they are just rearranged, the same happening for the letters in the words. Each level maintains its quality, what changing being the way they are rearranged in order for the higher level to emerge. The same happens when consciousness moves the body through the proposed mechanism. The eigenvalues of the wavefunctions are maintained. What changes is the probabilities with which they are obtained. This is referred by David Chalmers as "downward causation" [1].

I consider the term "causation" to not be the best choice to use when talking about this phenomenon. And the reason is as follow: when we think about causation, we think about a pair of entities, called "cause" and "effect", which are related through a necessary connection. To talk about downward causation in the case of emergence, is to say that, for example, sentences cause words, words cause letters, images cause colors, music cause sounds, etc., which doesn't really sound right. The reason the term "downward causation" is used in literature is because emergence is only seen as a 2 levels construct: consciousness and the brain, and through "downward causation" consciousness acts upon the brain making it to move the body. This only supposes a dynamic influence between consciousness and the brain. But as we saw throughout this paper, emergence is a much richer phenomenon, consciousness not being just one level of the hierarchy and the brain another, but consciousness itself being composed out of hundreds of emergent levels. Because of this, the term "downward causation" loses its purpose of capturing the influence of consciousness upon the brain, and instead gains a more general purpose of capturing the way higher levels influence lower levels.

In a previous section, I called it "top-down influence in levels", which is a more natural way of looking at the phenomenon: sentences influence the words that take part in them, words influence the letters that take part in them, etc. This better choice of terminology is even more helpful when we regard the mind-body problem. If we choose the terminology "downward causation" we appear to be faced with the problem of how exactly does the intention in consciousness to move the body causes the specific collapse of the wavefunction. Instead, if we choose the terminology "top-down influence in levels", this problem disappears, and what we obtain is the fact that the eigenvalues for each specific movement are constitutive parts of the intention, in the same way that words are constitutive parts of sentences and are not "caused" by sentences.

So, in the same way that a sentence brings with it its words and the words bring with them their letters and so on, the intention to move the body brings with it its eigenvalues of position for the electrons in the brain needed to move the specific part of the body. And as each sentence brings with it its specific words, each intention for the movement of a specific body part brings with it

its eigenvalues of position for the electrons in the brain. Under this better terminology, we see that there is no problem of how something causes something else. Instead, it offers a more natural feeling of how something is constitutive of something else. Of course, since at the moment we are working under a materialist-idealist mix, it is hard to see how can the eigenvalues of position for the electrons be constitutive parts of the intention in consciousness. This problem will also dissolve when we will go to the full idealist ontology.

For the moment, this is as far as we can go in integrating Quantum Mechanics into consciousness. In order to make full sense of what exactly is going on and how exactly does the mind move the body (how exactly the eigenvalues of position for the electrons are constitutive parts of the intention), we need to integrate the other pylon of current-day Physics into consciousness, and that is the Theory of Relativity.

Theory of Relativity

In the first part of this section, we will leave completely behind the integration of Quantum Mechanics, and we will talk about totally different ideas. This is because we need to find a way of dissolving the concept of a body. In the previous section, we got to the point in which consciousness influences a material body (the "electrons" in the "brain"). Such a dualist roadblock is not satisfying as an explanation for the world. We need to find a better way of regarding the material body in order for a consistent ontology to rise up. The Theory of Relativity will give us the necessary phenomenon in order to obtain the desired consistent ontology.

For this, we will need to finally abandon the solipsistic framework and to take for granted the existence of multiple consciousnesses in the world. Even though the existence of multiple consciousnesses might be fundamentally forever unprovable, it is an assumption that will help us move forward and it is an assumption that will turn out to offer a rather beautiful ontology in which everything that we presented in this paper will fall to its right place. The phenomenon that we would be using is the phenomenon of time dilation. That's the reason why we are employing the term "Theory of Relativity", not distinguishing between Special and General Relativity. The reason for why we are going to use only the phenomenon of time dilation is because this is the only phenomenon that has direct influence upon the experiences of consciousnesses.

The way Theory of Relativity is casted in material terms shadows the important phenomenology of time dilation when it is applied to consciousnesses. Even though the travelling twin remains younger than the staying twin, the importance of the fact that this is a phenomenon that directly affects the consciousnesses of the twins is overlooked. What we are going to do now is to have a better look at the famous twin experiment and see what this can tell us about the consciousnesses of the twins. The materialist way in which time dilation is tested is to send a material clock on a rapid moving object, such as an airplane, and compare the time on the travelling clock with the time on the earth clock and conclude that indeed the travelling clock registered less time. There is a problem with this approach in a solipsistic reality. If my consciousness is all there is, then it might all be just a dream and no conclusions can be drawn whatsoever about what happens in that dream.

In order to ground the results of Theory of Relativity in something solid, we need to assume the existence of multiple consciousnesses that are themselves the subjects of the time dilation. In such a case, the clock is not sent by itself in the travelling plane, but it is sent together with a consciousness that is observing it. At the return, the travelling consciousness will report its experiences of seeing the clock, and from these experiences the staying consciousness will conclude that the travelling consciousness had fewer experiences than it. This way, the time dilation is grounded in something beyond my solipsistic dream, so it can be concluded that it is a real effect, and a travelling consciousness does indeed experience less than a staying consciousness.

The next step is to understand why the travelling consciousness has fewer experiences than the staying consciousness. The theoretical framework of Theory of Relativity is of no help here, because we are working under the paradigm that consciousnesses are all there is, so we cannot invoke the notions of physical space, time, speed of light, etc. The way we regard time here is not as a geometrical dimension that stretches and compresses. We are regarding it from the point of view of the number of experiences a consciousness has as compared to another consciousness. And this is an empirically valid phenomenon, regardless of time being a geometrical dimension or something else. So, we cannot employ the theoretical framework of Theory of Relativity to understand why the travelling consciousness experiences fewer qualia than the staying consciousness. We need another approach that will take into account the fact that consciousnesses are all there is. As usual, we will start from a materialist-idealist mix, but then we will show how to drop the materialist ingredients, leaving only an idealist ontology that together with the above analysis of Quantum Mechanics will lead to a model of how consciousnesses directly interact among each other.

So, let's start and see what exactly might happen when one consciousness travels in respect to another stationary one. One aspect that is neglected from present-day Physics is the origin of motion. If we are to take 2 consciousnesses (embodied as humans let's say) that stay one next to the other in an inertial frame, nothing will happen for all eternity. They will just sit there one in front of the other and nothing will happen. But consciousness has a power that is nowhere to be spoken about in present-day Physics: consciousness can move the body. So, consciousness can create motion. Let's take 2 such consciousnesses sitting one besides the other in an inertial frame and analyze what happens. For a while, they just sit and nothing happens. Then one of them moves its body and pushes the body of the other consciousness, setting it in motion. This, according to the Theory of Relativity will cause time dilation in the body of the moving consciousness because of the changing of referential frames.

Let's analyze the elements involved in this phenomenon. We first have the 2 consciousnesses that we localize in the heads of the human bodies. Then, between the 2 consciousnesses we have a "physical world" that acts according to the Theory of Relativity and make the time pass slowly for the moving consciousness. One thing that Physics doesn't talk about is the origin of motion. Physics just takes for granted that motion exists and it writes for it equations of motion. But here we unavoidably have to talk about the origin of motion. It is not enough to say that for the travelling consciousness time passes slowly. Because if it wasn't for the stationary consciousness to push the other consciousness, there would have been no slowing of time for the moving

consciousness. So, something did indeed caused the time in the second consciousness to pass slower.

If we look at how the moving consciousness got to experience slower passage of time, we see that between the first and the second consciousness, there was a chain of causes and effects in the physical world. First, the stationary consciousness using its intention to move the body caused the body to move (by collapsing the wavefunction of the electrons in the brain). Then this sets in motion a series of events starting from moving of the muscles, pushing the body of the second consciousness, moving the body of the second consciousness and finally making the second consciousness to experience fewer qualia as compared to the first one. But, according to David Hume, there are no such things as causes and effects, because we cannot identify any necessary connection between a cause and an effect, no matter how hard we try [16].

Because of this, we cannot talk about a series of causes and effects between the intention of moving the body in the first consciousness and the slower passage of time in the second consciousness (as compared to the first one). So, we are only left to conclude that the intention in the first consciousness is directly responsible for the slower passage of time in the second consciousness, with no intermediary chain of causes and effects that takes place in a supposedly "physical world". This way, we finally get to drop the "physical world" from our ontology and be left with a purely idealist ontology in which consciousnesses directly interact. In this picture that we got to, we see that the Theory of Relativity is a theory about the interaction between consciousnesses, interaction that has a certain structure: an intention in one consciousness leads to a slower passage of time in the second consciousness.

Note that at this moment we are also freed from worrying about a "physical time". Since we are only left with consciousnesses, we are now dealing with the real time: the retentional passage of time in consciousness. So, Theory of Relativity reveals us that if we go beyond solipsism and assume the existence of multiple consciousnesses in the world, those consciousness are not independent from one another, but they are able to interact between each other. But we are not done yet. The conclusion that we got to is just an empirical conclusion. We haven't yet brought any explanation for why an intention in one consciousness leads to a slower passage of time in another. We have to find a theoretical framework from which this conclusion should arise naturally. So, let's now try and find that theoretical framework.

The idealist ontology

We reached the point where we have all the tools we need in order to develop an idealist ontology where the world is made up of consciousnesses and their interactions. A note to make here is that, as we will see, there are actually no interactions directly between consciousnesses. For example, the intention in one consciousness will not "cause" the slower passage of time in another consciousness, but it will "lead" to the slower passage of time in another (as I've been careful in the above section to use the word "lead" instead of "cause"). The distinction will be shown to be because of the properties of emergence that we presented throughout the paper. This distinction also avoids the problematic concept of causality as argued by David Hume. In the ontology that we will present there would be no concept of causality, neither downwards

causation, nor causation from one consciousness to another. All that we would have would be solipsistic consciousnesses living in their own worlds, but because of their emergent structures, choices in one consciousness will lead to modifications in the worlds of other consciousnesses.

Let's see what the integration of Physics into consciousness finally looks like. We started the development of this paper from 2 ideas: consciousness is all there is, and it has an emergent structure. Consciousness being all there is steams from the observation that we can never escape our own consciousness. Here is fruitful to define 2 types of solipsism: ontological and phenomenological. The ontological solipsism states that my consciousness is all there is. Phenomenological solipsism states that from the point of view of my consciousness, my consciousness is all there is. As we can see, phenomenological solipsism allows for an ontological conscious pluralism. The view that we will argue for is an ontological conscious pluralism in which each consciousness is stuck in a phenomenological solipsism. The solipsistic phenomenology of consciousness should be seriously taken into account in any theory of consciousness. Even though ontologically we can posit the existence of other entities, those entities should not violate the solipsistic phenomenology of consciousness.

As we will see, the phenomenology of emergence developed throughout the paper, together with the integrations of Quantum Mechanics and Theory of Relativity into the emergent structure of consciousness, allows for the satisfaction of the phenomenological solipsism. What the non-violation of phenomenological solipsism means is that whatever entities are out there, I should not be able to know about them or act upon them. Of course, I can make theories about them, but this is not the same as knowing them directly. Also, the inability to act upon them means there can be no intentional interactions between my consciousness and those entities. For example, it might appear that my intention in consciousness of moving the body causes the movement of the body, but as we will see, the entire ideas presented in this paper will lead to the conclusion that actually the movement of the body is not caused by my intention, but it is just an evolutionary selection that took advantage of the phenomenology of emergence.

Phenomenological solipsism restricts the actions of consciousness only to itself. Consciousness can never act outside of itself. However, given the fact that we also advocate an ontological conscious pluralism, then we still have to account for how those consciousnesses actually influence one another. So, these are our goals for this section: given the fact that consciousness is forever stuck in phenomenological solipsism, how are influences between consciousnesses still possible?

Let's look at Figure 2, which summarizes our ontology, and explain what all the parts of the figure mean.

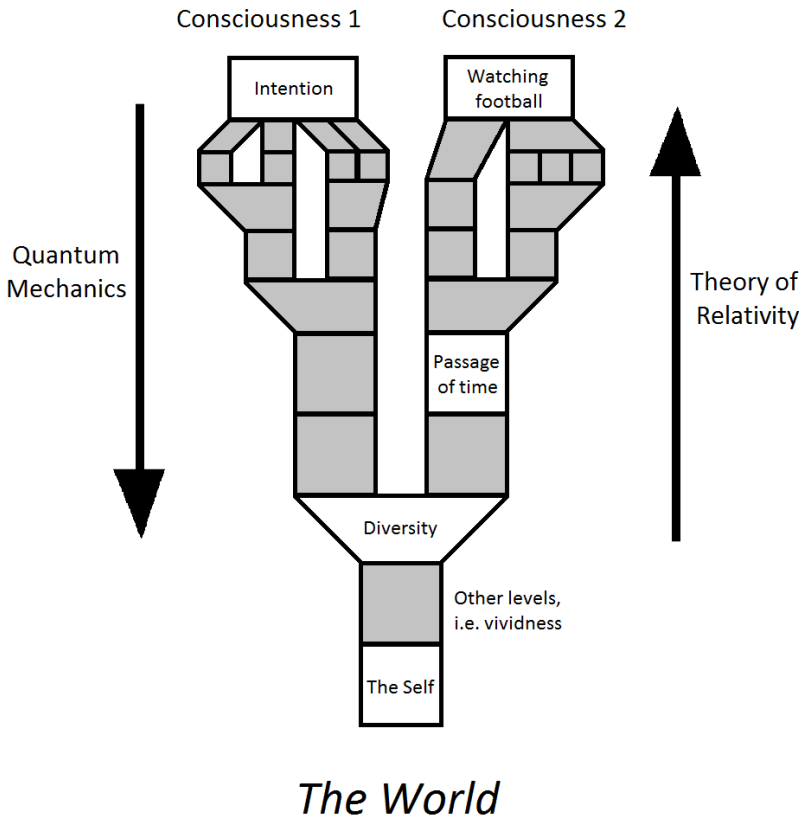

Figure 2. The ontological structure of the World

The first step in building our idealist ontology is the remark that even though no 2 consciousness can be alike, each of them experiencing ever slightest different qualia, they all have the same phenomenological Self. Even though my red might have a slightest different shade than your red, my Self is phenomenological identical to yours. So, if we are to assume an ontological conscious pluralism, then the phenomenological identical Selves imply a unique ontological Self common to all consciousnesses. The next step steams from the phenomenology of emergence. We saw that emergence has a multiple realizability aspect. For example, from the level of the shape of the duck-rabbit image, 2 different levels can emerge: the level of the duck and the level of the rabbit. This means that emergence leads to a ramification of consciousnesses. For example, you can give the duck-rabbit image to 2 persons and one of them can see a duck and the other a rabbit.

So, if we are making abstraction of all the complexities of a real human consciousness and we only consider this particular case of the duck-rabbit qualia, up to the point of the shape of the duck-rabbit, the consciousnesses of the 2 persons are phenomenologically identical. Then when one of them sees the duck and the other the rabbit, 2 different qualia levels are being emerged, which are experienced in 2 different consciousnesses. So, up to the point of the shape, the phenomenological identity of the 2 consciousnesses is indistinguishable from an ontological uniqueness. So, up to the point of the shape, we can talk about only 1 consciousness, and then the emergence of the distinct duck and rabbit qualia gives rise to 2 different consciousnesses. Notice

that this preserves the phenomenological solipsism, each of the 2 consciousnesses feeling that it is the only consciousnesses in existence, not being aware of what the other experiences.

Remember that for this example of the duck-rabbit ramification, we made abstraction of all the complexity of an actual human consciousness. If we take into account all the complexities that are found inside of us, the identity between me and my neighbor is clearly not at the point of the shape of the duck-rabbit image. But however different we all are from each other, there is still the level of the Self that is identical for all of us. So, all the consciousnesses in the world are connected through at least the level of the Self. Then, from the level of the Self various levels emerge in all kinds of directions and a ramification of consciousnesses takes place. Some consciousnesses might share more levels, others might share fewer levels. We thus explained the common Self and the ramification part of Figure 2.

Now let's talk about the integration of Physics into this "tree of consciousnesses". For this, we took 2 consciousnesses that are connected through a certain level. As we mentioned above, the branching level between 2 consciousnesses can be any level. The reason that in this figure we selected that level to be the level of diversity will be explained in what follows. In this figure, we also made Consciousness 1 to experience the quale of an intention and we made Consciousness 2 to experience the quale of watching football. Let's talk about C1 and see what having the quale of intention means. In the Quantum Mechanics section, we proposed a mechanism for how having the intention to move the body collapses the wavefunction for the electrons in the brain in certain positions as to lead to the desired movement of the body. Now is time to see exactly how this mechanism works. In explaining this mechanism, we also have to keep in mind not to violate the phenomenological solipsism. Therefore, the intention is not allowed to act directly on the body.

We need to find a workaround for this apparent shortcoming of consciousness being unable to act outside of itself. For this, we will remind ourselves the top-down influence in levels property of emergence. When we have the intention to speak a sentence in one's mind, this intention brings with it its sentence, the sentence brings with it its words, the words bring with them the letters, and so on. All these take part in consciousness. The intention of speaking a sentence acts solely on own consciousness. Because of this property of consciousness, we should also expect that the intention to move the body is in no way different. What the intention to move the body does is to bring with it, in own consciousness, its component sub-levels. Of course, it is difficult to specify exactly what those sub-levels are. But whatever they are, they are only brought inside own consciousness. They cannot act in any way outside of themselves. They have a strictly solipsistic phenomenology. To see this clearly, we can compare the cases of dreaming and waking-state of consciousness. Phenomenologically, the intention to move the body in the dream is identical to the intention to move the body in the waking-state. And since the intention in the dream doesn't move any "physical" body, then we should expect that the waking-state intention also doesn't move any body. But then, how are we to account for the fact that the body actually moves when we have the intention to move it?

To explain this, we will use the ramification of emergence. Also, we will bring into the picture the identification that we did between the level of diversity in consciousness and the level of probabilities in Quantum Mechanics. And the final ingredient will be the level of the passage of

time that is a level above the level of diversity. Having all these tools, everything can come together and give birth to an explanation for the World. Let's see how they all fit together. First, C1 will have an intention to move the body. This intention will bring with it, in a phenomenological solipsistic way, all its sub-levels all the way down to the level of the Self. But, evolution selected in our brains a mechanism through which from the level of diversity it emerged other levels. Thus, the intention in C1 affecting, in a phenomenological solipsistic way, all its sub-levels, also affects the level of diversity. Given the fact that evolution selected in our brains other levels to emerge from the level of diversity, those levels will be influenced by the modifications done in the level of diversity by the intention of C1.

These modifications will be felt qualitatively all the way up in C2, affecting all of its above levels, including the level of passage of time, and so affecting the rate at which C2 is watching football. Of course, if we are to talk about real brain mechanism, C2 will not be a consciousness that will watch football, but will be a consciousness that will have something to do with the positions of electrons in the brain. In a real brain mechanism, the intention in C1 by affecting, phenomenologically solipsistic, the level of diversity, which we identified as being the level of probabilities from Quantum Mechanics, it will influence the level of passage of time of "electrons" and this will appear from the outside as movement, which will set the muscles in motion.

Thus, we explain the 2 arrows in Figure 2. The first arrow is Quantum Mechanics because through intention, a consciousness has a top-down influence in its levels, influencing also the level of diversity which is the level of probabilities from Quantum Mechanics, selecting thus what positions the electrons should have in the brain. The second arrow is Theory of Relativity because C2 sharing with C1 the level of diversity, it will change its passage of time because of the change made in the level of diversity by C1, setting thus the electrons in the brain into motion. Of course, there are no electrons or brains. There are just systems of consciousnesses that influence one another through the tree of emergence. In a real case scenario, the influences are tremendous complex and they give the appearances of a physical world governed by Quantum Mechanics and Theory of Relativity.

We see that there can only be 2 types of interactions in the world: top-down and bottom-up. The top-down is the case of a sentence bringing its words or of music bringing its sounds, and the bottom-up is the emergence of new levels that depend upon the levels from which they emerge. This is all that this ontology allows. But they are enough to account for much of consciousness phenomenology and for its relation to the "physical" world. However, there is still another type of interaction that appears to exist and that is the unity of consciousness, by which qualia on the same levels unify into one quale: for example, the quale of seeing a chair and the quale of seeing a table are unified into the quale of seeing both a chair and a table. This is illustrated in Figure 2, by the fact the intention in C1 is a unification between 4 qualia, and the quale of watching football in C2 is a unification between 2 qualia. This might be indeed a fundamentally different kind of interaction than the top-down and bottom-up interactions, or it might be reducible to them. At this moment, I don't have any account for how qualia on the same level unify, so I will leave this problem open for future research.

The Future of Physics and Science

It's interesting to consider at this point what the prospects of Physics and Science in general are, given the ontology developed in this paper. One idea to mention here is that in simple present-day Quantum Mechanics experiments, the influences between consciousnesses are simple and they give birth to an apparent Born's rule. But in the cases of more complex influences, as for example those selected by evolution in the brains, the levels of Quantum Mechanics will become more malleable and Born's rule will disappear. Also, a biological organism should also be a system of consciousnesses influencing one another through the tree of emergence. Thus, the present-day "laws of Physics" should also be violated in Biology, Biology not being led by physical laws, but by influences between the consciousnesses that make up a biological organism. Given the fact that such influences are tremendous complex, they will be revealed one step at a time. For the time being, the progress in experimental Physics should be one in which a way should be found for the probabilities obtained in an experiment to violate Born's rule.

Both a difficulty and a helping hand are the identifications that can be done between the ontological subjective levels of emergence and the apparent effects that they lead to at the exterior. We saw how apparently random the identification that we did between the level of diversity and the level of probabilities was, but it paid up in allowing the development of a consistent ontology. By reflecting on what qualities a certain emergent level has, it can be imagined how such a quality can contribute to the appearances of a physical world, and so, come up with experiments that can take advantage of that quality and highlight influences that it has from a physical point of view. Such a way forward for Physics and Science in general puts an end to any attempt of obtaining a mathematical Theory of Everything. We saw that the way Quantum Mechanics and Theory of Relativity are related, makes them impossible to be reconciled through any mathematical theory.

Another route of research is to understand what governs emergence. Even though we took one of the properties of emergence to be the fact that a higher level cannot be predicted from a lower level, the fact that our consciousnesses has a particular set of qualia and we don't experience a chaos of qualia, it means that somehow the levels can be controlled and selected. This will require a mix of objective Science and directly experiencing consciousness. Maybe ways will be found for consciousness to influence from the inside what new qualia domains to experience. Lots of questions remain to be researched. Before concluding this paper, for completeness is good to also talk about the powers of the agency and see how they relate to emergence.

Powers of the agency

Besides the passive side of consciousness which only accounts for a slideshow of qualia that are just shown to us, consciousness also has an active side that apparently acts upon the world. As we saw above, the developed ontology already explains how consciousness acts upon the world: it doesn't. It only acts within itself. This solves lots of problems, as for example the so-called "causal-closeness of the physical world". Of course, the problem of the agency still remains open. Even if we only act upon ourselves, this still raises the question: "How do we do that?". How are we able to imagine, to think, to remember, etc.? I believe emergence also accounts for

these problems, even though maybe only partially. I will present how these actions are possible using some descriptions of personal experiences.

One of the most interesting experiences that occurred to me was an out of body experience. It was one particular beautiful day that was making me feel good above the average, and I was returning from university. When I got to my room, I laid in bed and I closed my eyes. I was perfectly conscious with my eyes closed, not falling into sleep. Then almost immediately after closing my eyes, I felt that I can get out of my body. It was a feeling that I never had before and I never had since. But at that moment I simply felt that I can do it. It felt to me the most natural thing to do. So, I decided to do it. The first few tries were quite difficult, only succeeding in raising my "soul" head just a little from the pillow. But eventually I succeeded. After getting out of my body, I set myself on the side of the bed and I looked in the room. Everything was just as usual. Strangely, it didn't occur to me to have a look at the body. Then I got out of the bed and went for the door. As I walking to the door, everything seemed normal in the room. But after I opened the door and had a look outside, things were differently than in reality. So, I decided to open my eyes and I was back in bed in my physical body.

To emphasize, I was aware of myself throughout the journey, including laying in bed, closing my eyes, exiting my body, walking across the room, opening the eyes. It was certainly not a dream. So, what are the teachings from this experience? Of course, I don't say I actually got out of my body. Everything was just a construction in consciousness. The actual important lesson to be learned from this experience is how powers are given to the agency. In normal life, we don't feel like we can get out of our bodies. We can even put ourselves in bed, close our eyes and concentrate on getting outside of body. This will not do it. At least for me, this was never successful, in the couple of times when I tried this intentionally. However, on that particular occasion, the feeling of being able of getting outside of my body was just given to me. I simply felt I can do it, and I did it.

So, the explanation, in the light of this paper, is that at that moment, the level of "being able to get out of body" was emerged. Having emerged, the agency simply was empowered and it just acted using this new level of power that was given to it. Probably what the agency is, is pure awareness, it is probably one of the qualities of the Self. As an ontologically subjective entity, the Self is able to be aware of itself, and this self-awareness is necessarily free. But it can only exercise its freedom if the proper emergent levels are given to it. Usually, in day-by-day life, the power to exit our body (in a strictly phenomenological sense) is not available to us. But in that day, the power was given to me, and I was simply able to do it.

Another experience in which my agency was empowered is as follow. One day, I was walking in the city and I noticed that random memories kept appearing in my consciousness. So, when I got home, I made dark in the room, I put myself in bed, I closed my eyes and I waited. Being isolated from the external stimuli, my mind was flooded with memories. Having this opportunity given to me, I tried to see if I can remember what I want. So, I tried to have a look at some childhood memories. With the most of ease, I just wished for and those memory were delivered to me. They were in great details that I never knew I still remembered them. It was almost as if I was reliving those experiences moment by moment. Then I tried to test this power even further. So, I chose to remember dreams that I had when I was maybe 10 years old. And with the same

ease, dreams from that age were simply displayed to me in great details, dreams that probably the morning after I had them when I was 10 years old simply disappeared and never came to my consciousness ever since. But here I was there, remembering those dreams in great details both their visual appearance and their moment by moment action. It was all there. This clearly convinced me that we never actually forget anything. And this is in accordance with the emergent structure of consciousness presented in this paper.

Since memory is one of the emergent levels, it makes all of the higher levels to also be memories. So, everything that we live is forever stored in the emergent level of memory. What we lack though in everyday life is our ability to retrieve those memories. Note that according to the ontology developed, the memories are stored in the emergent level of memory, not in the brain, the brain being just an appearance of a system of consciousnesses. And this is supported by recent experiments. In studies led by David Glanzman, memories were brought back in mice which were in incipient stage of Alzheimer [17]. If the memories would have been stored in the brain, then the destruction of the brain would have made the memories forever lost. What is probably actually happening in Alzheimer is that the emergent level of "being able to remember" is being destroyed, so the agency loses the power to access the level of memory. When Alzheimer is cured, what probably happens is that the emergent level of "being able to remember" is restored, so the agency can regain its ability to access the level of memory where memories are forever stored. If this is the case, then the study of Alzheimer can help us understand how the emergence of levels work.

The movement of the body is exactly the same type of phenomenon. But because of evolutionary advantage, we have it all the time. But in the same way that the above 2 examples might happen only few times in a lifetime, also the inability of moving the body might be experienced few times in a lifetime. In cases of sleep paralysis, even though the intention to move the body exists, it doesn't lead to any movement. So even though the agency is necessarily free because of its ability to be aware, it cannot act its will if the suitable levels are not being emerged in order to empower the will of the agency. This is even better seen in dreams where we can wish for all sorts of things: to move objects with our mind, to fly, to run super fast. But we can only exercise these abilities if the suitable emergent levels empower our will. Otherwise, monsters catch us because we can barely run, water shallows us because we cannot fly out of it, and so on.

Thus, we see that the active part of consciousness is also an emergent phenomenon. What distinguishes passiveness from activeness is merely a quality that the corresponding emergent levels have.

Computation out of non-computational elements

Even though consciousness is non-computational, the research from AI cannot be lightly disregarded. Even though the "brain" is only a visual quale that we have in consciousness when we look at it and a tactile quale when we touch it, the fact that the visual quale looks like a network of neurons and the fact that mimicking such network in artificial environments seems to replicate some of the functions of consciousness, such as pattern recognition, this suggests that something computational might be really going on in what appears to us as a "brain". However,

such a computational system cannot be built out of material elements, since there is no matter. Since consciousness is all there is, such a computational system must be created out of influences between consciousnesses through their non-computational emergent structure. Therefore, in what follows I will propose such a computer that will be based on the phenomenology of pleasure and pain. The brain will be regarded as a system of consciousnesses with one main consciousness that is us, selected by evolution to coordinate the body, and probably billions of other secondary simpler consciousnesses of pleasure and pain that by their interactions implement a computational system that helps the main consciousness to survive in the environment, thus to recognize patterns and to have proper qualia suited for its environment.

There are 2 reasons for selecting pleasure and pain as the elements for implementing computation. The first reason is that we need two elements to stand for the 1s and 0s that are used in a computer, and pleasure and pain through their opposite nature seems like good candidates. But this is not enough. For example, we could also choose black and white, but black and white don't offer the obvious necessary phenomenology that pleasure and pain offer in order to allow for a computer to be implemented through the emergent hierarchy. So, the second reason of choosing pleasure and pain is their emergent hierarchy. We know from the phenomenology of pleasure, that when we have pleasure, time passes very fast and also, we remember very little from what happened during those moments. It can also be debated whether time passes fast because we remember little, or we remember little because time passes fast, but this is not relevant here.

The phenomenology of pain on the other hand, is that when we experience pain, time passes very slowly and we have lots of memories of passing hardly through each moment of pain. So, both qualia of pleasure and pain act on the emergent levels of passage of time and memory. This is because of the top-down influence in levels that we already discussed many times: the quale of pleasure automatically brings with it a level of passage of time in which time passes fast and a level of memory where few things are memorized, while the quale of pain automatically brings with it a level of passage of time in which time passes slowly and a level of memory where many things are memorized. Is in the very nature of pleasure and pain to have these emergent structures. So, their opposite nature is not only at their highest level of pleasure and pain as such, but also in their emergent structures at the levels of passage of time and memory. Therefore, such qualia might be taken advantage of their emergent structures and implement a computational system. Let's have a look at Figure 3.

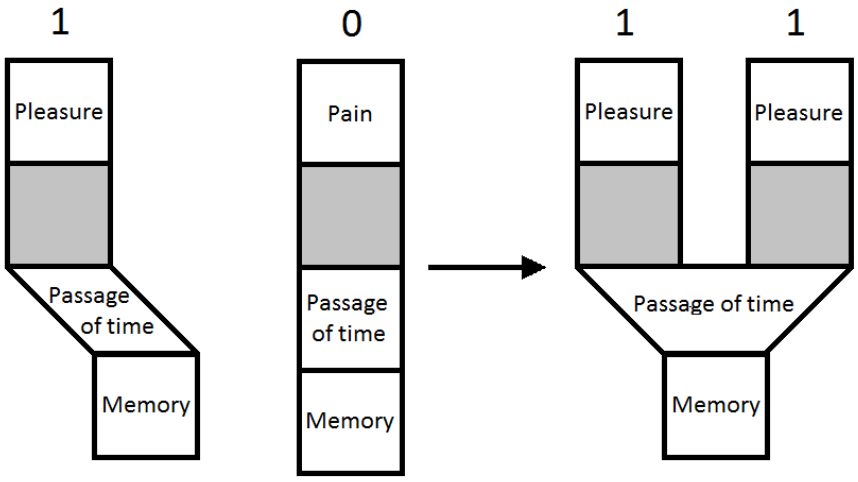

Figure 3. Computation out of non-computational elements

A way to take advantage of the phenomenology and emergent structures of pleasure and pain is depicted in Figure 3. On the left side of the figure we have 2 independent consciousnesses of pleasure and pain, that can stand for 1 and 0. Of course, they are not totally independent, being connected at least through the level of the Self, together will all the consciousnesses in the world. But as far as the levels of passage of time and of memory are concerned, they are independent. It might happen, through processes that are unknown to me at this moment, that the consciousness of pleasure unifies with the consciousness of pain through the levels of passage of time and/or memory. Pleasure bringing its fast passing of time to pain, it changes pain to pleasure, because there is no such thing as pain that has a fast passing of time. This way, 1 0 is changed to 1 1, so a computational interaction has taken place.

What I'm presenting here is just a sketch of the most elementary way in which a computational interaction can take place. The purpose is to show that the idealist ontology presented in this paper has enough richness as to allow for the reproduction of current research into the field of AI. More thinking into the problem can reveal lots of ways in which consciousnesses can interact and lead to advanced algorithms implementations. Even reversed engineering can be done: starting from computation, new emergent levels can be assumed to exist and then be uncovered such that they can act as building blocks for logical gates. Maybe the computations that take place in the brain don't use only pleasure and pain, but maybe some more intricate secondary consciousnesses that have qualia with better suited emergent structures that can take part in certain algorithms.

Also, another phenomenological point that needs to be taken into account is the fact that not only this computational system provides help to the main consciousness of a brain, but also the main consciousness order through intentions certain computations to be realized. This is unlike anything that is found in the artificial imitation of a real brain. In an artificial system, the inputs have to come from a human consciousness through indirect means, like using a keyboard, and the outputs are also read by humans through indirect means, like using a display. But a real brain would by a system of directly transmitted inputs and outputs between the secondary consciousnesses and the main consciousness. So, the secondary consciousnesses can never be regarded as a pure computational system. It is a semi-computational system, that can at any time

be disturbed by the qualia of the main consciousness, so even though to a certain degree it might implement some computational functions, it will ultimately be still a non-computational system that can never be replicated artificially.

Conclusions

Given the amount of ideas presented in this paper, a natural doubt arises regarding how many of them are correct. Might this be the way the world is actually structured or is it just a paper full of speculations? I think that the answer to this question depends a lot on the introspection of the reader. Being so immersed in consciousness, the fact that consciousness has an emergent structure goes completely unnoticed. But I think that careful introspection at the richness of phenomenology presented in this paper, would make the case for emergence solid. Then from this to integrating Physics into consciousness is a matter of careful thoughtfully processes. Of course, no testable predictions have been made in this paper. But for the time being, I believe that just a familiarization with the fact that consciousness has an emergent structure will be fruitful in setting the mindset of the reader in a different direction than the current computational approach to Science, and so to open new ways of thinking about the world. If such a realization on the part of the reader, that the emergent structure of consciousness is inescapable and so the world itself must have an emergent structure, takes place, then until the apparition of testable prediction is just a matter of time.

Are there any real objections against emergence? I would say that in fact there are, and we must mention them here. There are in principle, at least two aspects of consciousness that seem to go against emergence, and they are: creativity and understanding. Even though one of the properties of emergence is that you cannot predict a higher level from a lower level, creativity seems to do exactly this. To create a work of art for example, you need to take the levels of colors and shapes and emerge from them, at your own will, new levels that have never been experienced before by any consciousness in the world. How is creativity able to do that? A risky answer might be, as we saw in the section about the powers of the agency, that the emergent level of "predicting another level" is emerged, so a sort of self-reference upon the very nature of emergence being realized, this way emergence transcending itself. But I will be very careful in putting forward this answer.

Getting back to the second aspect of consciousness mentioned above, understanding seems to also be able to advance in levels. For example, even though we might not get from the levels of numbers and powers to the level of Fermat's Last Theorem, it is still possible that somehow, we are still able to prove and understand Fermat's Last Theorem. However, even though creativity and understanding seem to go beyond emergence, it still remains impossible for us to imagine a new color or to experience a new sensory qualia domain altogether. So, even though there surely are elements of phenomenology that challenge emergence, there are many other elements of phenomenology that can be explained only by assuming that consciousness has an emergent structure.

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(*The End*)