Commentary

Whitehead Crosses the Bridge Between the Physics and Psychology of Time — Interview of Remy Lestienne
by Anne Giersch

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Abstract
This commentary is about two papers on the relations between the neuroscience and the physics of time. One is by Buonomano & Rovelli, entitled ‘Bridging the neuroscience and physics of time’ and the other one is by Gruber, Block & Montemayor, entitled ‘Physical time within human time’. The present commentary takes the form of an interview of Remy Lestienne, who published a book on the work of Whitehead, related to the two papers cited above.

Keywords
consciousness, Block Universe, causality, illusion, Planck limit, quantum gravitation

Anne: The debate between physics and neuroscience typically centers around the argument that time is not real or that it is illusory. That view stems in part from one of Einstein's quotes: “The distinction between past, present, and future is only a stubbornly persistent illusion.” My first question is about your book on Whitehead's philosophy, just translated to English, concerning time (Lestienne, 2022). In your view, what is Whitehead's main contribution to the debate concerning the nature of time?
Remy: I think the main contribution is about the now, the ‘present’, (Lestienne, 2018). But technically this was not his starting point. His starting point is contrary to what some physicists say, namely that time does not exist. He asserts that time does exist, but that the instant does not exist. It is one of the reasons for which he chooses not to speak about time but about ‘process’. Process for him is the true motor of the world. This process works by delivering bits of time so that the instant, the sharp limit between past and future of the now does not exist, this sharp limit is impossible. So the present is thick. What William James (see McDermott, 2013) already taught us, but for Whitehead it is not only the psychological present that is thick, it is really the deliverance of bits of time, ontologically, which is important. Nowadays, some physicists thinking about quantum gravitation have the same thought, that at the Planck limit, times are also delivered as elementary bits.

Anne: So, the next question is, there is a chapter in your book about Whitehead and Bergson. Would you mind providing the essence of how Whitehead’s views relate to psychology and the phenomenology of time?

Remy: Bergson (2014) and Whitehead shared many parallel ideas. They were respectful of each other and it is a pity that they did not collaborate. We know, in fact, that Bergson came to visit Whitehead once at Whitehead’s house in London but we don’t know what they talked about. We know also that they read some of each other’s books and reported that they were very interesting books. But I think they were a little shy with respect to each other. Whitehead at the time of their encounter said that he was a novice in philosophy and Bergson was clearly a novice in mathematics, not at the level of Whitehead anyway. But they shared three main ideas. The first is that the past is real, it is incorporated into the present and the past enriches the present. The second is that the present is thick but, unlike Whitehead, Bergson thought mainly about the psychological present being thick, like William James. The third common idea is that determinism has limits. But here, again, there is a difference. Bergson had in mind only living things, particularly living things endowed with consciousness. For Whitehead, the limit of determinism, the margins of creativity, was a property of what he called the process itself. It concerns every element of reality in cooperation and harmony. For Whitehead every element of reality had the secular wish to collaborate with other entities in order to satisfy the goal of a better harmony in the world. Bergson had intuitions which were similar to those of Whitehead, up to a point. But Bergson conserved his intuition only in the realm of life, or mainly in the realm of life, while Whitehead has proposed a mechanism for that, what he calls concrescence, and prehension, to make his intuition understandable, and extendable to all real entities. This is the process, that
determines all real entities. So, in that, to my mind, Whitehead was a big step ahead of Bergson.

Anne: Could you actually define concrescence?

Remy: Yes. In order to distinguish time from the motor of the world, he called the latter the process. Process is the motor of the world. Process makes the elements of reality pass from potentialities to actualities. It creates the tangible reality. The past remains real, although it is not concrete or actual. Thus, the St. Augustine aporia states: the past is gone and no longer exists, the present cannot exist because it has zero duration, and the future does not exist either, because it is potentiality (see Hernandez, 2016). This aporia is, therefore, twice eliminated. Both past and present are real. For Whitehead, determinism exists, but it has not the full power that classical physics endows it with. The mechanism of prehension (that is the first important word used by Whitehead) between past elementary entities and elementary entities in the process of production, by the process, between elementary entities of the past and entities which are going be real, consists in the transfer of information between them. Also, the process must obey the law of special relativity, right? But the future is not written. The future is for the large part represented by the prehension. The future belongs to the realm of causality, but this is not all that happens in the process. There are margins of freedom, so to speak. But the now, the idea of the flow of time, the idea of causality and at the same time of a margin of freedom, are all the main constituents of the process mechanism. And they fit with our vision of what I can call the mesoscale. I believe that physics should account for what we see in the mesoscale even though there are properties of the flow of time, or the process, which may be different from the microscale of the cosmic realm.

Anne: The next question is: some physicists present spacetime cosmologies as a mechanism to account for the flow of time that we experience. The growing-block universe (Ellis, 2014) is an example. Is there a psychological need in your opinion to reify time and not feel as if we are living with an illusion?

Remy: I am delighted by the physicist’s consideration of the growing-block paradigm. Let me say, on this occasion, that I do not consider spacetime as the pre-existing frame to all reality. This is not my view, nor that of Whitehead, not even that of Einstein after he created the general theory of relativity. To my view, the physicists that take into consideration the growing-block paradigm have understood Bergson and Whitehead in that the past continuously
enriches the present. But on this occasion I should also remind us all that a lot of discussion about relativity was based on the fact that for two observers at high speed, one with respect to the other, two events, A and B, can be reversed in their order, for the two observers. I see this as a strong argument against the ontological now. But I like very much Jenann Ismael's counter-argument, which is raised in the forthcoming series of volumes, *Time and Science*, that will be published next spring (Lestienne and Harris, 2023). Ismael says that if it is true that for the two observers at high speed the time sequence of events may be reversed, at least they never know it. Therefore, the fact is true, from a theoretical point of view, but it has no application in reality. Thus, I believe that we should not take too seriously the condolences of Einstein about the death of his friend Michele Besso (who is said to 'still be there' in the past). I would like to remind you that Einstein himself once told in this context that his grief for the death of Besso cannot be scientifically justified by physics, because the now (and the distinction it entails between past and future) is illusory.

Anne: Talking about the now, what is the now for you? Is there any difference to be made between a physical and a psychological now?

Remy: Of course, there are a lot of differences between the physical now and the psychological now. We should not forget that we are conscious beings. Objects are made and maintained in real life, in real time, but of course they don’t know that the time is flowing. Lower animals may have an acute sensation of living in the present, but a rather weak capacity to transport themselves in time. We remember our infancy and think about our deaths, so we have a robust capacity for transporting ourselves in time. We know that the so-called irreversibility of time only becomes evident when we are dealing with complex systems. Some physicists have developed a theory of the emergence of time. This is the time based on thermodynamic considerations, with a level and structure that allows for its emergence. Consciousness, of course, is what makes us so sensitive to time, much more so than other beings. As you know, these considerations have made J. T. Fraser, the founding member of the International Society for the Study of Time, develop a hierarchical theory of time (see Fraser, 1972). It fits more or less with Whitehead's thinking, but not completely; there are difference between them. And we know today that Whitehead’s theory, when he tried to formulate it in mathematics, was wrong, in some parts. But I thin, it remains of very high value from a heuristic point of view and that new developments are possible. For instance, I was impressed recently to learn about theoretical progress made in looking at Whitehead’s process theory from an information-theoretical perspective,
a scientific information point of view, saying that at the concrescence what happens is a transfer of information from the past to the present.

The work of William Solis is also something I am thinking about. All things considered, I think that the *now* is not a human illusion, no more than the openness of the future. The fact that there are some obstacles to bringing what is present at the psychological realm to the world of physics depends mainly on problems of emergence.

Member of the audience: I have a follow-up question for Remy, on the most fundamental thing you talked about, Remy, namely, that the universe is one of processes. It’s interesting because physicists like Rovelli (2019) take the view that, rather than looking at time per se, the universe is filled with events. Perhaps Rovelli might be willing to agree with you that we don’t have to deal with the instant. But I would ask you: is Rovelli’s Universe of Events the same thing as Remy’s and Whitehead’s Universe of Process? Are they equal?

Remy: Yes. I don’t see, from this point of view, what difference we are talking about just now. There is no difference I can see between Rovelli’s and these views. I think, as you may do too, that we have not solved, even in our minds, all the ambiguities and conflicts, to speak like J. T. Fraser, i.e., all the conflicts brought into our minds by time. But we are beginning to be more convergent in our views. If you think about the thinking of Lee Smolin (2013) who believes firmly in the reality of time, and Rovelli, they were very apart at the beginning and progressively I think they have converged, and now they can exchange ideas and make something more concrete.

Anne: Thank you so much for sharing your views and your influence from Whitehead’s philosophy.

**References**


