Review of: "Dingle's “Clock Paradox” Disproof"

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Potential competing interests: No potential competing interests to declare.

Qeios Peer Review Team invited me to review this paper. What follows is my review report on the first version of the paper by Mr. Sfarti.

I share the concern expressed by another reviewer about the excessive shortness of the paper. The problem is not the length *per se* but the lack of proper context. In the introduction, the author quotes only the last few sentences of the criticized Dingle argument making it arduous for the reader to understand what the author is disproving.

Moreover, the abstract gives the impression that the entire arguments presented by Dingle over the years (and collected in his book "Science At the Crossroads") just boil down to the argument criticized in the paper under review. That is not the case. What the author criticizes is only one of the first criticism published by Dingle in *Nature*. It is presented only in Appendix II of the book. Dingle's criticism of relativity (correct or wrong) is much more profound and insightful than what appears to be by reading this hasty paper. I also invite all the readers to read Dingle's book.

If Mr. Sfarti had quoted the whole argument by Dingle, it would have been soon clear that, in a specific sense, it hardly could have been dismissed. Nowadays, the argument is well-known to the point of being felt as trivial (or trivially wrong), but I believe it is not. In short, Dingle considers two observers, A and B, moving at a uniform relative velocity. According to special relativity, for observer A, time in B runs slower than in A. And, owing to the principle of relativity, for observer B, time in A runs slower than in B. Therefore, for Dingle, the relativistic slowing of time cannot be, in any case, a **real**, **physical** phenomenon. It is just a mathematical illusion. As an analog, consider the same two observers, A and B, this time relatively stationary and holding a 1-m stick each. A and B are also far away one from the other. For observer A, the stick hold by B is smaller than his stick (because of the distance). For observer B, the stick hold by A is smaller than his stick (because of the distance). But this does not mean that there is a real, physical shrinking of the sticks. It is physically impossible. It is just an "optical" illusion. Dingle wanted to prove that the same impossibility must logically (and physically) hold with the Lorentz transformations and special relativity.

One may object that time dilation finally materializes and becomes measurable when one of the observers accelerates. However, this does not change the import of Dingle's criticism. First, it has long been proven that time dilation can be derived with three observers, all always moving with relative uniform velocities. Second, even with the acceleration of one of the two observers, time dilation **mathematically** depends only upon relative velocity and on the time during which the observers relatively move with uniform velocity. By arbitrarily increasing that time, the influence of the short acceleration period can be made negligible. Therefore, time dilation must only depend upon the relative uniform velocity, but this is paradoxical, as shown by Dingle.

In conclusion, the calculation presented by Mr. Sfarti is formally correct, but it can hardly dismiss the conceptual, logical, and philosophical challenge put forward by Dingle in the criticized argument for the reasons I gave above.