Why Astrophysicist Herbert Dingle Rejected Relativity

Dr. Pierre Sabatier

ABSTRACT

Referring to the example of the famous twin paradox, astrophysicist Herbert Dingle argued that Special Relativity is false: two clocks, he said, cannot run slow relatively to each other. His argument implied that the two clocks and their readings were real, in accordance with naive realism. It will be shown that they are not real but part of the observers' subjective perception of reality - in which case, nothing prevents them from being different. Thus, it is naive realism which is wrong, not Relativity.

Keywords: special relativity, naive realism, perception, reality, twin paradox.

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I. INTRODUCTION

Most physicists consider philosophy a confused, approximate, needlessly complex discourse, in any case alien to scientific rigour - "a marshy territory, full of bogs and often invaded by the Germans" as it was described (*) on which they venture most unwillingly. When they have to, they go the shortest way: common sense philosophy, i.e. naive realism - of which scientific realism is a some more elaborated variant (Miller, 2004, Liston). They regard this view as the simplest and the most rational, the one with which everybody intuitively agrees because of its obviousness. So that most authors dont even care to formulate it explicitly and generally take it as implicit.

This vague and tacit consensus is nonetheless a philosophical option. But an option which is difficult to question as far as it is not expressely designated as such - making the debate more blurred.

The controversy started around the middle of the XXth century by astrophysicist Herbert Dingle against the majority of the scientific community about Special Relativity is an example of such confusion (Dingle, 1972, Sochi, 2016). Under the appearence of a scientific debate, it was in fact a philosophical debate about reality. If both sides could not agree, it was paradoxically because they shared the same naive realistic worldview.

We'll come back to it later. First let us consider the issues at stake.

II. REALITY AND PERCEPTION

Naive realism has several variants, which can be summed up to two basic assumptions:

- There exists an all-encompassing observer-independent reality.
- This reality is "what is perceived or perceivable", as Bergson put it (Bergson, 1968).

In short, if I perceive something, it is because this something exists out there, independently of me - because it is real. Therefore, what I perceive is real.

So far, so good. But only until the act of perception is committed. Because it changes the nature of the perceived object.

The act of perception is an act of *interiorizing* the outer world by the observer: in committing it, he symbolically appropriates the outer world by reconstructing it abstractly in his consciousness on the basis of the stimuli he receives from it. In the course of an extremely complex coding process, he separates it from its physicality and transforms it into a non-physical replica of itself, an abstract representation which he interiorizes.

The purpose of this symbolical appropriation of the world is biological in the first place: it is the

way in which the observer manages to know his surroundings in order to use their resources for the production of his own existence (Akins, 1996, Heyer, 2002, Bruce and Green, 1985).

To correctly fulfill its function, perception must then be as reliable as possible - within the scope of the perceiving subject's needs and capabilities. There is no universal perception, that could take in all the aspects of the part of reality the subject interacts with. Each species obeys its own requirements and develops its own perceptive strategy with regard to the ecological niche in which it has settled. The criterion of reliability of this strategy is the efficiency of the empirical actions it permits. The fact that the living species succeeded in surviving in more or less harsh surroundings during millions of years shows how reliable their perception has proven to be.

But it is nevertheless limited, so that the information it produces, if reliable, gives only a partial and more or less approximate view of its object. The more so that within one given species, each individual makes his own choices and has his own priorities. More than a neutral and passive reproduction of reality, it is a subjective and active interpretation of it. So that there are not two identical perceptions of the same object or event.

This being said, though perception is subjective in the last resort, every member of the human species has the same perceptive system - then roughly the same perceptions, so that they confirm each other, inducing to think that they are objective. Thus, having access to reality through their perception and considering it highly reliable, human beings logically conclude that what they perceive and what is are one and the same thing.

Yet, for all the previously cited reasons, they are not. All the more so for example because the act of perception is always posterior to the event or object that is perceived: on the one hand because the stimulus travels a more or less long time before reaching the observer (sometimes thousands of years in the case of a remote star). On the other hand because after receiving the stimulus the optical apparatus needs some time to construct a visual image (Turner, 2007). So that perception is always late relatively to reality: we perceive not what is but what was - and is no more.

Besides, in the case of visual perception, what we see is not the object itself but the flow of photons bouncing off it, so that they reveal it and hide it at the same time. And anyway, what reaches our senses is something else than what we think it is.

And lastly, are perceived only the aspects of reality which are accessible to the observer's sensory apparatus - the observables - which are only part of what exists, so that reality cannot be reduced to what is perceived or perceivable.

In short, contrary to what is assumed by the scientists's implicit naive realism, what is perceived is not reality as it is in itself, it is reality as it is in its physical interaction with the observer, it is reality filtered and reconstructed by the observer's sensory system: reality as it appears to him, not as it is.

This means that if we take the information given by perception as real and objective, we may come to wrong conclusions - that no mathematical formalization, as elaborate as it may be, will be able to correct. We will then run into unexpected contradictions - which we'll politely call paradoxes.

III. DINGLE AGAINST RELATIVITY

Now let us go back to Herbert Dingle and the twin paradox, which he used to demonstrate his critic of Relativity (Dingle, 1972).

This paradox is well known: a pair of twins are living side by side on Earth, then one of them flies away on a longspatial trip at a speed close to the speed of light. The twin who remains at home then notices that the traveller's time elapses less quickly than his own: when he is back on Earth, his twin has become younger than he (Langevin, 1923).

But, observes Dingle, this effect is reciprocal: for the traveller, the one moving is his brother, so

that he is the one who becomes younger. In other words, each twin becomes younger than the other, each clock runs slower than the other, which is imposible. At the risk of shocking the scientific establishment Dingle concluded that Special Relativity was false.

His opponents tried their best to prove him mistaken. But it does not seem that they succeeded in a convincing way. After several attempts, Popper himself eventually failed to disprove Dingle's argument and renounced to publish the article he had written (Hayes, 2010).

From the point of view of naive realism, Dingle was undoubtedly right: two cloks cannot run slow relatively to each other. At least if they are both real, as assumed by naive realism.

It does not seem that both sides have considered that they might not be. Naive realism does not permit such an hypothesis. And, for the reasons that were exposed at the beginning of this article, there is no questioning naive realism.

But if we consider real only that which exists independently of the observers, it is clear that the slowing down of time does not belong to this category. Each twin perceives the other's time as slowed down, says Relativity : the slowing down of his brother's time is what he *perceives,* not what *exists* independently of him. And what he perceives depends on him and his relation with what surrounds him. If this slowing down of time were an objective, real, observer-independent phenomenon, each of them would observe not only his brother's time being slowed down, but also his own, his proper time. But this is not what takes place - reality is not self- contradictory.

What is perceived by each twin, i.e. the slowing down of his brother's time, is then only the subjective way in which he perceives reality, the interpretation he gives of it in his own, separate, reference frame. And then nothing prevents two observers in two different reference frames to have two different perceptions of reality, to perceive the other's time as slower than his own. It is the opposite that would be weird.

Conversely, if what is perceived were objective reality, the situation would be more alarming : it would mean that we have here two objective realities and not one. More generally, it would mean that there are as many objective realities as there are observers- i.e. that there is no objective reality at all, that what is is just what is perceived, in accordance with George Berkeley famous formula "Esse est percipi aut percipere" - that we are in a solipsistic world, not a realistic one (Berkeley, 1713).

IV. CONCLUSION

With his example of the twin paradox, Dingle wrongly accuses Relativity : it is not Relativity which is at fault, it is its interpretation by naive realism, with which it has been asociated. This in turn means that Relativity and naive realism are not compatible, that the latter does not permit to interpret correctly Relativity, that Relativity demands a more elaborate realism. But a realism which requires us to admit the inadmissible : to admit that, contrary to what is quasi-unaninumously believed all around the world, what I perceive, what is out here, in front of me, this tree, this cloud, this streetlamp, this fishmonger, are not Reality, independent, objective, etc, but only My reality, my own subjective - or intersubjective - representation of reality.

The alternative is to dismiss Relativity, as did Herbert Dingle.

(*) I apologize to the author of this superb definition: in spite of doing my best, I could not recall his name.

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