EINSTEIN'S "TRAIN" THOUGHT-EXPERIMENT CONTRADICTS THE THEORY OF RELATIVITY

by

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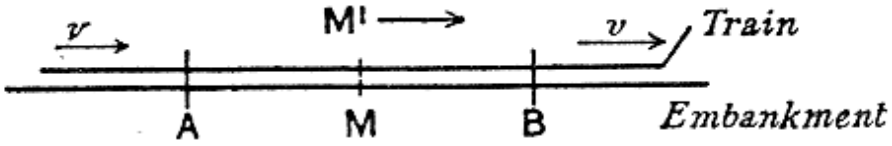
EINSTEIN writes in his book *Relativity: The Special and General Theory* (1920):

> **IX. The Relativity of Simultaneity**
>
> We suppose a very long train travelling along the rails with the constant velocity **v** and in the direction indicated in **Fig. 1**. People travelling in this train will with advantage use the train as a rigid reference-body (co-ordinate system); they regard all events in reference to the train. Then every event which takes place along the line also takes place at a particular point of the train. Also the definition of simultaneity can be given relative to the train in exactly the same way as with respect to the embankment. As a natural consequence, however, the following question arises:
>
> Are two events (*e.g.* the two strokes of lightning **A** and **B**) which are simultaneous with reference to the railway embankment also simultaneous relatively to the train? We shall show directly that the answer must be in the negative.
>
> **FIG. 1**
>
> 
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> When we say that the lightning strokes **A** and **B** are simultaneous with respect to the embankment, we mean: the rays of light emitted at the places **A** and **B**, where the lightning occurs, meet each other at the mid-point **M** of the length **A → B** of the embankment. But the events **A** and **B** also correspond to positions **A** and **B** on the train. Let **M'** be the mid-point of the distance **A → B** on the travelling train. Just when the flashes of lightning occur, this point **M'** naturally coincides with the point **M**, but it moves towards the right in the diagram with the velocity **v** of the train. If an observer sitting in the position **M'** in the train did not possess this velocity, then he would remain permanently at **M**, and the light rays emitted by the flashes of lightning **A** and **B**

> would reach him simultaneously, *i.e.* they would meet just where he is situated. Now in reality (considered with reference to the railway embankment) he is hastening towards the beam of light coming from **B**, whilst he is riding on ahead of the beam of light coming from **A**. Hence the observer will see the beam of light emitted from **B** earlier than he will see that emitted from **A**. Observers who take the railway train as their reference-body must therefore come to the conclusion that the lightning flash **B** took place earlier than the lightning flash **A**. We thus arrive at the important result:
>
> Events which are simultaneous with reference to the embankment are not simultaneous with respect to the train, and vice versa (relativity of simultaneity).

What?!? In *reality* the observer on the train "is hastening towards the beam of light"? But didn't we hear Einstein say just a few moments earlier that according to the Principle of Relativity, it should be *impossible* to tell whether a person or an object is in *reality* moving or not?!?

So which is it to be, Mister Genius? Is the guy on the train moving in *reality,* or is he moving only *relative* to the embankment?

If the former, the Theory of Relativity stands refuted, because according to it there can be no such thing as movement *in reality.*

And if the latter, then the above argument of Einstein's about the relativity of simultaneity stands refuted, because there is no movement of the guy in the train in *reality,* and he can only be moving *relative* to the embankment, and to the people on it. So even if to *them* it appears that he does not see the flashes simultaneously, to *him,* since in *his* frame — *i.e.,* relative to *himself,* and of course to the train as well — he's not going anywhere, it should appear that the flashes *are* seen simultaneously!

Any comments? e-mail me.