Translation into English: Chapter 2 - Catalogue of Errors for Both Theories of Relativity

from the German documentation of G.O. Mueller

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D: Time / Error No. 6

Albert Einstein maintains that time dilation (a slowing of time; a time delay) between two inertial systems in relative motion is a real effect

AE (1905, p. 904) maintains that between two inertial systems in motion with respect to each other a time dilation (TD) exists: "If there are synchronously running clocks at points A and B of K at rest, as seen in the system at rest, and if one moves the clock at A with velocity v along the connecting line towards B, according to the readings given by the clock at B the two clocks are no longer running synchronously, but the clock moving from A to B runs vis-à-vis the clock at B from the start by ... [formula] more slowly. [...] One sees immediately that this result also holds when the clock moves in an arbitrary polygonal line from A to B, even if the points A and B coincide."

For the following presentations an eye must be kept on the term "system at rest", which again reappears here; it "rests" without a reference and unconnected, as already introduced in AE (1905, p. 892), and is therefor absolutely set. This will be treated as a cardinal error under E 1. Here, this hidden, system absolutely "at rest" is the true reason for Albert Einstein's claim of a real slow-running of the also absolutely "moving" clock.

Albert Einstein discusses, for two synchronized clocks A and B in the "system at rest" (which he calls K), three different paths for a journey by clock A:

(1) from point A to point B along the "connecting line", to a clock at point B. The result? Before the journey both clocks were synchronous, after the journey they are no longer synchronous, the moved clock A now running behind.

(2) clock A travels along an arbitrary polygonal line in an arbitrary curve towards B, which is not however curved, but is comprised of several straight part-paths so that no rotation, which would involve acceleration, takes place. The clock need only experience turning at the corners of the polygonal path travelled. In this case too; after its arrival at B the moved clock A is again running behind the clock that remained at B.

(3) as the third variant, points A and B coincide, the path travelled representing a closed ring comprised again of straight part-paths. In this case too, the moved clock A, after its return to the starting point, again runs behind the clock that remained stationary.

For all 3 journey variants the same holds true, that during its journey clock A is no longer part of the "system at rest". This in turn makes clear that on every journey it is an independent moving system that moves, with respect to the "system at rest", with the constants velocity v.

In variant (1) clock A moves along the "connecting line" to B, which may well be interpreted as a straight line, whereby its motion is rectilinear and constant, i.e. it is an inertial system.

In variants (2) and (3) the moving system clock A changes only its direction at the corners of its polygonal travelled path, its velocity remaining constant. As to whether clock A in this case is still an inertial system, Albert Einstein appears to think so. For all three cases, at any rate, he claims the real slow-running of the moving clock.

The criticism recalls to mind the first principle of the theory (of relativity) and demands, in accordance with the theory, the relative reciprocal consideration from the moving system of clock A, which is also supposed to be an inertial system. Albert Einstein appears to have forgotten this consideration. The inertial system clock A may consider itself as being at rest, because in keeping with the principle of relativity all motion is relative, and comes to the conclusion, after meeting clock B, that clock B is running behind. The findings of the two systems thus contradict each other.

Since, in terms of two clocks, running behind can only be a valid description for one of the clocks, the author of the theory is thus faced with the question as to which of the two equally justified systems is correct in its claim. Is it clock A that is running behind, or clock B? The question is Herbert Dingle's. It cannot be answered from the STR due to the principle of relativity. A period of 6 years of public enquiry in Great Britain has brought no answer from the STR.

Albert Einstein and his relativists cannot explain, on the basis of the STR, which system is correct with its claim.

For this reason, in keeping with the STR there is no running behind, but only a clock. And if the relativists were to declare that, on the basis of the principle of relativity, both claims are correct (which they don't, in this connection), then there would still be no running behind, but just one clock against the other.

(The question as to why running behind on the basis of relative motion should take place in the first place is not part of the subject matter of the error discussed here.)

Various attempts have been made by several relativists to save of the real running behind of the moved clock. As the most prominent example, only A. Sommerfeld will be quoted here, with his comments to the reprint of text of Minkowski's lecture of 1908 in the anthology, "Das Relativitätsprinzip" 5th edition 1923, pp 67-71.

Sommerfeld develops 2 equations on two different world lines between the same world points and states (p. 69): "This is what the running behind of the moved clock vis-à-vis the clock at rest, as brought out by Einstein, is based on. This statement is based, as Einstein has stressed, on the (unprovable) assumption that the moved clock indeed shows its own time, i.e. in each case shows time that corresponds to the stationary-envisaged, instantaneous speed-state. The moved clock must naturally ... have been ... accelerated. The running behind of the moved clock does not, therefore, show the actual 'motion', but 'accelerated motion'. This does not therefore contradict the principle of relativity itself." Sommerfeld too is characterized by the rampant use of unexplained inverted commas.

The critics first thank Sommerfeld for confirming that the assumption is unprovable. Apart from this, Sommerfeld has overseen the fact that Albert Einstein also clearly described clock A in journey variant 1 as an inertial system, i.e. not accelerated. The option of accelerations, therefore, does not hold. Variants 2 and 3 were described by Albert Einstein himself as being equal and as having the same result. In other words, Sommerfeld's attempted explanation is contrary to that of Albert Einstein. But Sommerfeld wants to save the running behind of the moved clock and thereby Einstein's authority at all costs, even if this means contradicting its author, and he complements the process out of the STR by way of supposed "accelerations", which cannot be justified within the STR. The critics also take exactly the same view, namely that a real running behind cannot be justified on the basis of the STR. To this extent the critics again agree with Sommerfeld.

Any justification of the running behind from outside the STR is uninteresting for the critics of the STR. In the context of the STR it doesn't exist. And this is, after all, also the view taken by the confessed relativist Sommerfeld.

Why Albert Einstein forgot to apply the reciprocal consideration for the travelling clock A as an inertial system in keeping with the principle of relativity can possibly be explained in that, in his scenario on time dilation he introduces a "system at rest", without saying with respect to what it was "at rest". It is the same "system at rest", unconnected and without a reference, as already introduced by him at the outset (page 892); one which, according to the principle of relativity, ought not to exist. It is this clandestinely introduced, absolute reference system that repeatedly leads to faulty argumentation in the course of the treatise:

- on p. 895 the "coordinate system at rest" appears in the scenario of the measurement of the rigid rod;

- on p. 896 in the footnote in relation to the "time of the system at rest";

- on p. 897 "space at rest" is merely a variant;

- on p. 902 a moving rod is measured in the "system at rest" without the reciprocal measurement;

- and on p. 904 the moved clock is considered from the "system at rest" only, without the reciprocal consideration.

It is difficult to understand how someone, in treating the STR, which was initially emphasized as a supposedly fundamental principle, can then manage to consistently forget it. And always whenever it has to do with the deduction of real effects.

AE 1905. - Das Relativitätsprinzip : Collected Works of Treatises / H. A. Lorentz, A. Einstein, H. Minkowski. 6th edition., unaltered. reprint of the 5th edition. 1923. Darmstadt: Wiss. Buchges., 1958. 159 pages.