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

from the German documentation of G.O. Mueller

"*On the Absolute Magnitude of the Special Theory of Relativity - A Documentary Thought Experiment on 95 Years of Criticism (1908-2003) with Proof of 3789 Critical Works*" - Text Version 2.1 - June 2004
http://www.ekkehard-friebe.de/kap2.pdf

Translator: Rothwell Bronrowan

D: Time / Error No. 2

Albert Einstein denies any simultaneity between bodies in relative motion

Prior Remarks. Clock synchronization is only one application of simultaneity. - After having reduced time to a characteristic of the clock (cf. Error D 1), for Albert Einstein there are as many times as there are bodies with clocks in different places. With this, the question as to the "same time", i.e. simultaneity and whether and how this can be ascertained, is only a valid one for him (those who do not artificially divide time into portions have no problems with simultaneity). In the process Albert Einstein makes the following distinctions: (A) the simultaneity of occurrences or the settings of clock hands at one and the same place is recognized by him as being unproblematic (AE 1905, p. 893); (B) the simultaneity of distant occurrences that are not moving with respect to each other, e.g. two fixed-location clocks on the same body (reference system), and can be created by synchronization with beams of light, is also recognized by him (AE 1905, p. 894); (C) but the simultaneity of distant occurrences on bodies (reference systems) that are moving with respect to each other cannot, according to Albert Einstein, be clearly, or absolutely ascertained, because according to his claim, "two simultaneous" occurrences in one coordinate system can be held to be simultaneous, whereas in a system differently in motion they are held to be "no longer simultaneous occurrences" (AE 1905, p. 897).

Cases A and B are recognized by Albert Einstein as simultaneity, but he contests simultaneity for case C. On the other hand, simultaneity as an identity of precise time can only be determined or disputed. In this matter there are no transitional states (a bit more simultaneous, a bit less simultaneous), which is why the contestation of simultaneity means its abolition and not, as it so nobly sounds in the relativistic language, a "relativization" of simultaneity. This clarification is of considerable importance, because it shows a breach that no relativist has so far been able to explain; why in two cases simultaneity exists and in the third case it does not, not even in a relative context.

The criticism recognizes, in the contestation of simultaneity, a consequence of the mistake already outlined in Error D 1, i.e. that time comes from the position of the hands of the clocks. An analysis of the supposed abolition of simultaneity in case C, in keeping with AE1905 (pp 892-897) is very instructive. The setup of the experiment for simultaneity is as follows (pp 896-897). Two objects are introduced, a reference system in which the clocks at rest have already been successfully synchronized with the light-signal procedure (as described on p. 894), and a rigid body (rod) that is in motion relative to the reference system. The clocks are attached to both ends of the moving rod, which are running synchronously with the clocks of the reference system and at each of the two clocks there is an observer. Both observers now synchronize their clocks with each other with the help of the light-signal procedure (although these clocks are already supposed to be synchronized - see above). In this connection the same formula (speed = distance travelled per time taken) is used for in each case for the outbound and return journeys of the light signal: with

- time of travel of the light (between the rod ends),

- rod length,

- velocity of rod v (vis-à-vis the reference system)

- and speed of light V.

This gives two equations. The signal on the outbound journey and the signal on the return journey both travel the same rod length and are in this respect equal to one another. In the one (outbound) direction, however, the velocity of the rod is subtracted from the constant speed of light V, (V - v), whereas in the opposite (return) direction the velocity of the rod is added to V, (V + v). In this way unequal quotients are given (the same rod length per unequal speeds), from which Albert Einstein deduces that the clocks of the observers in motion at the rod ends are not running synchronously, whereas the clocks of observers at rest in the reference system, by contrast, are running synchronously, which is why in this case there is no absolute simultaneity.

This curious procedure shows the following explicit errors:

(1) The fundamental error. Albert Einstein does not treat the moving rod as is required by his principle of relativity, i.e. as reference systems of equal value, but deduces his non-simultaneity only for the clocks on the rod. In other words, he forgets to take the same approach for the clocks in the reference system, which would lead to the same, but reciprocal result. The disregard for reciprocity is evident throughout.

(2) Albert Einstein applies different calculations for the synchronization. On the one hand he assumes the validity of synchronizations with light signals within his reference system in that he deduces the entire running time for the light signal in the reference system over the outbound and return journeys (p. 894). On the other hand he calculates two separate and different running times for the outbound and return journeys for the synchronization of the clocks at the rod ends, setting one relative light-signal velocity as (V - v) and the other as (V + v) and obtaining in this way, naturally, no true synchronization of the two clocks. In the one case he adds both running times and takes an average, in the other case he separates these into two partial running times and does his calculations with different values. These different calculations for the same process constitute an impermissible and easily detected trick. Either the calculation with the averaged running time (p. 894) is correct, in which case this also applies to the clocks at the ends of the moving rod and gives a correct synchronization, or the calculation for the clocks at the rod ends (p. 896 below, and p. 897 above) is correct, in which case this also gives no synchronization for the clocks of the reference system. The difference alleged by Albert Einstein arises only because he does not treat the reference system and the moving body (rod) as relative and equal, disregarding his own principle of relativity in the process. Neither Albert Einstein nor his followers have dispelled this contradiction. In fact, they probably haven't even noticed it.

(3) Two different speeds (V - v; V + v) are given for the light, although this cannot be the case according to Albert Einstein's own principle of constancy. In each of his systems there must and may only be one measurable speed of light, namely V (= c)! With V - v and V + v the speed of light itself becomes a relative speed, thereby losing its pompously alleged absolute constancy vis-à-vis all observers.

(4) Albert Einstein claims an initial synchronization, although he does not state how this is to be achieved. The clocks at the ends of the moving rod are said to be initially synchronous "with the clocks of the system at rest". How can Albert Einstein have achieved simultaneity for this synchronization when the rod was moving against the "system at rest" and he wants to prove that there is no simultaneity between moving systems?

(5) If, however, the alleged initial synchronization was established while at rest with respect to the reference system, according to Albert Einstein this synchronization no longer applies in the subsequent relative state of motion, because his relatively moving clocks are supposed to run more slowly.

(6) Whichever of the two possible situations for the alleged initial synchronization one prefers, one version violates his time dilation for the moving clock, while the other version makes use of synchronization between moving systems, the invalidity of which Albert Einstein subsequently seeks to prove, i.e. a clear contradiction between the precondition and the conclusions.

(7) What purpose, by the way, is this initial synchronization supposed to have, when both clocks are subsequently supposed to be synchronized with each other by means of the light-signal procedure?

(8) The starting time stipulated in the synchronization procedure is declared in footnote 1 (p. 896) as the '"time of the system at rest' and at the same time as the 'position of the hands of the moving clock'," in which "at the same time" there is a simultaneity. But how can this simultaneity between two bodies in relative motion have been established? Again in this footnote Albert Einstein works with simultaneity between bodies moving relative to each other, a simultaneity he subsequently seeks to show is impossible: the well-known circular contradiction. He himself makes use of something as a precondition the existence of which he then subsequently denies.

(9) According to the principle of relativity, the reference system and the rod moving relative to it represent two systems of completely equal entitlement. This means that for both systems the same equations hold, also for synchronization. Albert Einstein's different calculations thus contradict his principle of relativity, which claims that the effects between inertial systems exhibit complete reciprocity. Had he been consequent, he would have selected, in keeping with case B, two secure, simultaneous occurrences

*anywhere in observational space and would then have had to determined how the observers in **both** systems evaluated the times of these two occurrences. But he didn't take this approach. According to his own principle of relativity, the observers in both systems would have to have come to the same result, agreeing on recognition or on non-recognition of simultaneity. Had they failed to agree on it, they would clearly have made an error, because simultaneity in keeping with case B is regarded as absolutely assured.*

(10) Albert Einstein's decree as to which clocks in which system in what synchronization were to measure the processes at the moving rod can be found on p. 896, paragraph 5, and is completely unclear. Any interpretation here would only be an invention of clarity.

(11) The error of different synchronization calculations arises in Albert Einstein's presentation from a tacit treatment of the reference system (coordinate system) as a "coordinate system at rest" (p. 895) without any details being given as to what it is, with respect to which this "system at rest" is actually at rest. Or put another way, he makes use here of a clandestine absolute reference system that, according to his theory, cannot exist.

Since Albert Einstein's derivation is completely incorrect and his attempted abolition of simultaneity in case C is unsuccessful, and since all three cases, A - C, take place in the same physical observational space, the very same time applies to them at all places, which is why simultaneity also applies for all places in observational space. There are at least six proofs of this:

(1) The physical concept of time derives from the comparison of different movements at random places in space. For this reason its validity cannot be subsequently, and quite arbitrarily, assigned and limited to specific places in space, nor can its validity be made dependent on the states of motion of individual bodies within this space.

(2) In the solar system at least some bodies move with different speeds, and the astronomers on the earth calculate the positions of these bodies successfully on the basis of a standardized time scale and simultaneity. There is no case C in which simultaneity does not hold for specific places in observational space, because a body there is moving relatively. As regards the explicit stipulation à la Albert Einstein, that two occurrences seen from one system can be held to be simultaneous while from another system they can be held to be non-simultaneous, this forms no part of the approach taken in astronomy.

(3) Whitrow reports (1966 and 1981) the reintroduction of worldwide time (p. 573): "... cosmologists studying the expansion of the universe were led, about 1930, to reintroduce the concept of world-wide time, so that the relativity of time became an essentially local phenomenon for observers in motion relative to the cosmic background."

(4) The recognized simultaneity in case B for distant occurrences at rest with respect to each other cannot be denied to a third occurrence taking place at a location between these two occurrences, only because this is in motion. The validity of simultaneity over a certain distance, once recognized, proves the validity within the observational space of this distance.

(5) If, for case C, Albert Einstein contests simultaneity between two specific occurrences, he must be able to state with what other (!) occurrences these occurrences of case C are supposed to be simultaneous (he does not dare to state, after all, that there are occurrences that are not simultaneous with any other occurrence whatsoever!), etc. He must in this way construct h i s network of simultaneity relationships applying to all bodies spread throughout space that are at rest, relatively speaking, with respect to each other (case B), a mechanical connection here being unnecessary, whereas all other bodies spread throughout space and moving relative to case B (case C) fall out of the simultaneity network. If the bodies of case C change their relative states of motion (as they continuously do in the real world), they might then, vis-à-vis each other, or as bodies of case B, enter the state of being relatively at rest and then belong, perhaps temporarily, to the simultaneity network of Albert Einstein. Since at the same time Albert Einstein's principle of relativity is supposed to apply, as a consequence of which there is no absolute reference system, every body can regard itself as being at rest and can regard the other bodies as being in motion relative to it, so that every body can construct its own simultaneity network and can penetrate the different simultaneity networks in space. In this case Albert Einstein's distinctions between cases A - C would be superfluous.

(6) For all rotating bodies of our solar system, the same fixed-star sky appears to rotate, though for each body on different axes and at different speeds. By observations and calculations, astronomers on each of these bodies could determine their own place and the simultaneous places of the other bodies, just as astronomers on the earth do, it being assumed in this connection that the achievable accuracy of measurement is unable to encroach on the recognized simultaneity.

Conclusion: Albert Einstein's deductions are based on serious errors. If one were to take them seriously, physics would be confronted with two explicit alternatives. Either there is simultaneity for all points in

observational space regardless of the states of motion of bodies; or the concept of simultaneity is revoked by Albert Einstein as being useless, in which case nobody can put the occurrences found in observational space in a sequence. Physics could only choose the alternative that allowed one to recognize the order of occurrences. Fortunately there are no two [such] alternatives.

Albert Einstein makes two major errors: in two cases he concedes absolutely sound simultaneity, so that he cannot later reject this concept; and he fails to maintain that there are occurrences that are simultaneous with nothing else in the world whatsoever. - Whitrow reports the public admittance of the reintroduction - "about 1930" - of the absolute, worldwide valid, *single* time and thereby simultaneity, and combines it with the consolation that the "relativized time" of the STR at least still applies "locally". The logical argument, however, still needs to be demonstrated, i.e. how in the stomach of the great standardized time the endlessly many locally relativized times are to be applied.

As already seen in the introduction of solely local time taken from the clock, in the case of simultaneity Albert Einstein again seeks to derive the concept (of simultaneity) from the technical stipulation (of the synchronization). - Given his far-reaching claims as to time and simultaneity, Albert Einstein knows too little about the clocks to be able to say in what his time is supposed to stick. He says only that they should all be "of precisely the same characteristic property" (p. 893). A funny physicist, who doesn't interest himself in the technology and in the physical laws governing his clocks.

In the propaganda writings of the relativists Albert Einstein's presentation of time and simultaneity is celebrated: "It is exactly in this that the boldness and the high philosophical meaning of Einstein's idea that he disposes of the old prejudices with a time that is valid for all systems" (v. Laue 1913, p. 37). In these words one senses the relief of the physicist: achieved at last! - However, in physics, as in all other fields, it is not primarily important whether the ideas are bold and meaningful, but whether they are true.

M. v. Laue 1913. - Bergson, Henri: Durée et simultanéité [1. éd.] : à propos de la théorie d'Einstein. Paris: Alcan, 1922. 245 pages, Engl. translation: Bergson: Duration and simultaneity / introd.: Herbert Dingle. Indianapolis: Bobbe-Merrill, 1965. 190 pages - Whitrow, Gerald James: Time and the universe. In: The voices of time. Ed.: J. T. Frazer. New York 1966, pp 564-581. - 2nd ed. 1981.