

On Einstein's Irrational Ontology of Redundancy

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By studying various people we can see what difficulty that they have had with Einstein's Special Relativity (SR). The following is a look at Christopher Jon Bjerknes' article "Einstein's Irrational Ontology of Redundancy: The Special Theory of Relativity and Its Many Fallacies of *Petito Principii*" [1a]

Bjerknes starts by saying: "Albert Einstein's arguments were almost always fallacies of *Petito Principii*."

First let's look at *Petittio Principii* from a site on that issue [2a]:

Petito principii (circular) argument is described and several examples are noted.

I. ***Petitio Principii***: (circular reasoning, circular argument, begging the question) in general, the fallacy of assuming as a premiss a statement which has the same meaning as the conclusion.

A. The least convincing kind of *petitio principii* is the repetition of the same words in the same order in both premiss and conclusion.. Generally, such an argument would not be misleading and would only be given in unusual circumstances, *e.g.*, the speaker is very tired, talking to a child, or talking to a subordinate. Two examples follow.

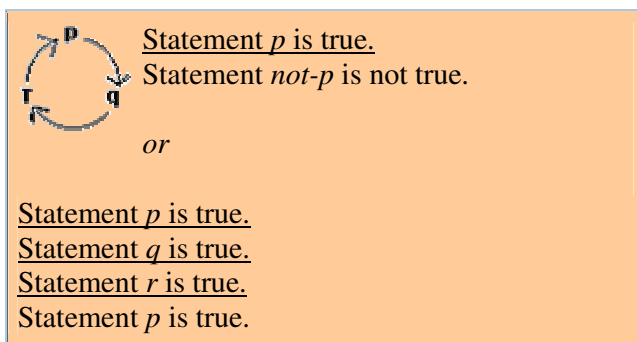
1. "Dear Friend, a man who has studied law to its highest degree is a brilliant lawyer, for a brilliant lawyer has studied law to its highest degree." Oscar Wilde, *De Profundis*.
2. --"What a brain! And you know how to prove things, like the big shots?
--Yeah, I have a special method for that. Ask me to prove something for you, something real hard.
--All right, prove to me that giraffes go up in elevators.
--Let's see. Giraffes go up in elevators ... because they go up in elevators.
--Good, that was great! ... Suppose I asked you to prove giraffes don't go up in elevators.
--That's easy. I just prove the same thing, but the other way around."
Fernando Arrabal, *El Cementerio de Automoviles, el Arquitecto y El*

- B. A more common kind of *petitio principii* is the transformation of the conclusion into a premiss using logical or grammatical principles. For example ...
1. "You know that God is a just and loving God because God is God and cannot be unjust or unloving."
 2. "Women write the best novels because men do not write novels as well."
 3. "There are many juvenile delinquents because many juveniles break the law, and the reason so many juveniles break the law is that they are juvenile delinquents."
- C. A third kind of *petitio principii* is the use of an intermediate step in shifting to the same meaning from the premiss to the conclusion. A linking of premisses and conclusions return to the beginning. For example ...
1. "The soul is simple because it is immortal, and it must be immortal because it's simple."
 2. "I once overheard three brothers dividing two candy bars. The oldest one gave each of the two younger ones half of a candy bar, and kept a whole bar for himself. When asked why he got more candy, he said he was the smartest. A few minutes later, one of the younger ones asked why he was the smartest, and in reply the oldest said 'Because I have more candy.'" Ernest J. Chave, *Personality Development in Children* (Univ. of Chicago, 1937), 151.
- D. The most difficult kind of *petitio principii* to identify is the kind where the premiss and the conclusion have the same "propositional content." *I.e.*, the statements are suitable paraphrases of each other, and each depends upon the other for its truth.
1. "The elemental composition of Jupiter is known to be similar to the sun... The core would be composed mainly of iron and silicates, the materials that make up most of the earth's bulk. Such a core is expected for cosmogonic reasons: If Jupiter's composition is similar to the sun's, the planet should contain a small portion of those elements." J. Wolfe, "Jupiter," *Scientific American* (Vol. 230 No. 1), 119.
 2. The following example is a description of a *petitio principii* committed by Engel:

"A law has been named after Engel in light of this work. Engel's law states that 'the poorer the individual, the family or a people, the greater must be the percentage of the income needed for the maintenance of physical sustenance, and of this a greater proportion must be allowed for food.' It is odd to find this as a law, since Engel had used the proportion of outgoings on food as the measure of material standard of living." Ian Hacking, *The Taming of Chance*, (Cambridge Univ. Press, 1990), 140.

3. A contradiction to my theory of dream produced by another of my women patients (the cleverest of all my dreamers) was resolved more simply, but upon the same pattern: namely that the nonfulfillment of one wish meant the fulfillment of another. One day I had been explaining to her that dreams are fulfillments of wishes. Next day she brought me a dream in which she was traveling down with her mother-in-law to the place in the country where they were to spend their holidays together. Now I knew that she had violently rebelled against the idea of spending the summer near her mother-in-law and that a few days earlier she had successfully avoided the propinquity she dreaded by engaging rooms in a far distant resort. And now her dream had undone the solution she had wished for; was not this the sharpest contradiction of my theory that in dreams wishes are fulfilled? No doubt; and it was only necessary to follow the dream's logical consequence in order to arrive at its interpretation. The dream showed that I was wrong. *Thus it was her wish that I might be wrong, and her dream showed that wish fulfilled* (italics original)" Sigmund Freud, *The Interpretations of Dreams* (New York: Avon, 1966), 185.

II. The informal structure of the *petitio principii* is usually similar to one of the following.



III. The reason *petitio principii* is considered to be a fallacy is not that the inference is invalid (because any statement is indeed equivalent to itself), but that the argument can be deceptive. A statement cannot prove itself. A premiss must have a different source of reason, ground or evidence for its truth from that of the conclusion.

Now **back to Bjerknæs** --

Bjerknæs: He (Einstein) argued well-known experimental results as if *a priori* first principles.

me: To be fair to Einstein he was trying to form a theory from first principles that conformed to experimental results (but he did not say what those experiments were in his 1905 paper).

me: Bjerknæs accuses Einstein of plagiarism. The claim of plagiarism is dubious. Einstein was just allowed to publish papers without citing sources; that seems unfair that he was allowed special privileges, but we cannot deduce plagiarism from special privileges. So I am going to delete mention of them from here-on.

Bjerknæs: Einstein would then induce, as if deducing, the well-known hypotheses of others, and deduce from these [...] hypotheses the same experimental results as conclusions, which he had first stated as premises. This was Einstein's *modus operandi* for [...].

me: The claim of plagiarism will now be deleted using [...]

Bjerknæs: In the special theory of relativity, Einstein argued light speed invariance, a well-known (supposed) experimental result at the time, as if an *a priori* first principle, which an empirical measurement cannot be, to then induce through analysis, as if deducing in synthesis, the "Lorentz Transformation" hypotheses.

me: I think it (lightspeed invariance) was not a well-known experimental result at the time, and I argue in other articles that interpreting from lightspeed invariance can be a mistake.

Bjerknæs: Einstein then used the "Lorentz Transformation", the true set of hypotheses of the special theory of relativity, to deduce light speed invariance as a conclusion, a conclusion which Einstein had already presumed as a premise.

me: Einstein did some bogus math. But in this case he supposedly obtained in 1905 paper the Lorentz transformations from his 2 assumptions about relativity and lightspeed invariance, and then showed how that math conformed to those assumptions. I have argued in other papers all that was bad (bogus) math full of mistakes.

Bjerknæs: Einstein employed the same fallacious method in the general theory of relativity. Einstein irrationally asserted the well-known experimental gravitational-inertial mass equivalence of Bessel and Eötvös as if an "*a priori*" postulate, which an experimental result cannot be, only to arrive at it as an ultimate conclusion, a conclusion redundant to the premise.

me: Actually on this issue it is considered a virtue that a postulate to be used in the construct of a theory's math has experimental backing.

me: In the case of the lightspeed invariance postulate, I have argued in other papers that there was no experimental backing for it, and that it was misinterpretation of experiments (from a Newtonian physics perspective). The proviso has to be that experiments be interpreted from Newtonian physics that assumes lightspeed variation and then one can observe that. In the case of SR the assumption is lightspeed invariance and then time measurements and distance measurements are adjusted to conform to that belief. So, experiments give lightspeed variation from Newtonian

physics based on assuming lightspeed variation. But experiments based on being interpreted by SR don't.

Bjerknes: The quasi-positivistic analyses Einstein presented by turning the synthetic scientific theories of his predecessors on their heads have been applauded, ridiculed and often misrepresented as synthetic, which they are not.

me: synthetic means- made artificially; not genuine, insincere. Einstein did turn things around from their usual way of looking at things with his 1905 paper on SR. Ideally he should have looked at the physical situation and showed whether it could be dealt with by Newtonian physics before supposedly coming up with another theory.

me: It is my contention that existing physics theory could handle the physics, so there was no need to look at things differently from the existing theory. However all that gets lost in the mess Einstein made.

Bjerknes: In 1905, Mileva Einstein-Marity and Albert Einstein [1] coauthored a paper on the "electrodynamics of moving bodies".

me: Bjerknes is claiming that the 1905 paper on SR -- "Zur Elektrodynamik bewegter Körper", *Annalen der Physik*, Series 4, Volume 17, (1905), pp. 891-921 was coauthored by M. Einstein-Marity and A. Einstein, with Marity being Einstein's wife. But some dispute this co-authorship and it is by no means definitely shown that Einstein's wife co-authored, so I will delete comments to that from now-on. [4a]

Bjerknes: Fallacies of begging the question emerge even in the very introduction to the work. [...] Einstein acknowledge in [...] [his] introduction, that light speed invariance and the symmetry of electrodynamic phenomena were well-established phenomena.

me: Einstein does not! At least in his 1905 paper on SR he does not do what Bjerknes says. I will quote what Einstein starts by saying [3a] -

Einstein : It is known that Maxwell's electrodynamics--as usually understood at the present time--when applied to moving bodies, leads to asymmetries which do not appear to be inherent in the phenomena. Take, for example, the reciprocal electrodynamic action of a magnet and a conductor. The observable phenomenon here depends only on the relative motion of the conductor and the magnet, whereas the customary view draws a sharp distinction between the two cases in which either the one or the other of these bodies is in motion. For if the magnet is in motion and the conductor at rest, there arises in the neighbourhood of the magnet an electric field with a certain definite energy, producing a current at the places where parts of the conductor are situated. But if the magnet is stationary and the conductor in motion, no electric field arises in the neighbourhood of the magnet. In the conductor, however, we find an electromotive force, to which in itself there is no corresponding energy, but which gives rise--assuming equality of relative motion in the two cases discussed--

-to electric currents of the same path and intensity as those produced by the electric forces in the former case.

Einstein: Examples of this sort, together with the unsuccessful attempts to discover any motion of the earth relatively to the "light medium," suggest that the phenomena of electrodynamics as well as of mechanics possess no properties corresponding to the idea of absolute rest. They suggest rather that, as has already been shown to the first order of small quantities, the same laws of electrodynamics and optics will be valid for all frames of reference for which the equations of mechanics hold good.¹ We will raise this conjecture (the purport of which will hereafter be called the "Principle of Relativity") to the status of a postulate, and also introduce another postulate, which is only apparently irreconcilable with the former, namely, that light is always propagated in empty space with a definite velocity c which is independent of the state of motion of the emitting body. These two postulates suffice for the attainment of a simple and consistent theory of the electrodynamics of moving bodies based on Maxwell's theory for stationary bodies. The introduction of a "luminiferous ether" will prove to be superfluous inasmuch as the view here to be developed will not require an "absolutely stationary space" provided with special properties, nor assign a velocity-vector to a point of the empty space in which electromagnetic processes take place.

me: Bjerknæs seems to be taking what Einstein says about experiments seeming to suggest – "...suggest that the phenomena of electrodynamics as well as of mechanics possess no properties corresponding to the idea of absolute rest." – as meaning the experiments support the two postulates. i.e. Bjerknæs is mistaking the idea of "no absolute rest" with the postulate of relativity with postulate of lightspeed invariance. Actually by relativity principle there is no absolute rest, but the lightspeed invariance does not mean it. It is this sort of error by critics of Einstein that can lead to confusion.

- (A) "no absolute rest" implies relativity principle
- (B) "no absolute rest" does not imply lightspeed invariance.

It is a mistake by Bjerknæs to think "no absolute rest" implies the two postulates. Discussions on relativity fall apart on these issues. To clarify things further – the relativity principle pre-Einstein should be called something like "classical principle of relativity", because some combine both "classical principle of relativity" with postulate of lightspeed invariance to give "special principle of relativity." i.e. there are different types of "relativity principle". Also for lightspeed invariance – there is conditions attached with that—for us having to consider scenario of light in perfect vacuum free of influences of fields and any other factors that might change its speed.

Back to Bjerknæs-

Bjerknæs: Well-known specific phenomena are not, by definition, "*a priori*" general concepts.

me: But Einstein is doing things the other way around and treating them as postulates to then form his theory at least he's doing that in 1905.

Bjerknes However, [...] Einstein[.] asked us to abandon reason and assert specific experimental results and empirical observations, as if *a priori* general principles.

me: there was no abandoning "reason" on this issue; Bjerknes just seems to find it hard to grasp doing things the other way.

Bjerknes In other words, [...] Einstein[.] engaged in an analysis of the problems of invariant light speed, and of the symmetry of electrodynamic phenomena in alleged violation of Maxwell's theory, which problems faced physicists at the end of the nineteenth century; and [...] Einstein[.] irrationally pretended that these two problems were solutions of themselves.

me: Maxwell's theory does not give lightspeed invariance; but it has been falsely claimed that it does by many. Einstein seems to have interpreted that it should give lightspeed invariance. Bjerknes has valid points though worded badly.

Bjerknes: Henry August Rowland stated the two main problems facing the physicists of his day, on October 28th, 1899, and I have italicized that which [...] Einstein[.] would later call "two assumptions", or "postulates":

Bjerknes: "And yet, however wonderful [the ether] may be, its laws are far more simple than those of matter. *Every wave in it, whatever its length or intensity, proceeds onwards in it according to well known laws, all with the same speed, unaltered in direction, from its source in electrified matter to the confines of the Universe, unimpaired in energy unless it is disturbed by the presence of matter.* However the waves may cross each other, each proceeds by itself without interference with the others. [***] *To detect something dependent on the relative motion of the ether and matter has been and is the great desire of physicists. But we always find that, with one possible exception, there is always some compensating feature which renders our efforts useless.* This one experiment is the aberration of light, but even here Stokes has shown that it may be explained in either of two ways: first, that the earth moves through the ether of space without disturbing it, and second, if it carries the ether with it by a kind of motion called irrotational. Even here, however, the amount of action probably depends upon relative motion of the luminous source to the recipient telescope. So the principle of Doppler depends also on this relative motion and is independent of the ether. The result of the experiments of Foucault on the passage of light through moving water can no longer be interpreted as due to the partial movement of the ether with the moving water, an inference due to imperfect theory alone. The experiment of Lodge, who attempted to set the ether in motion by a rapidly rotating disc, showed no such result. The experiment of Michelson to detect the ethereal wind, although carried to the extreme of accuracy, also failed to detect any relative motion of the matter and the ether [*Emphasis Added*]." [2]

[...] Einstein[..] turned reason on its head and called these two *a posteriori* problems, *a priori* "postulates".

me: Bjerknes still has problems with working from two postulates (a priori) to get some consequences with experiments that give those postulates (a posteriori)

(a) experiments give results that become postulate (1) and postulate (2)

(b) postulate (1) and (2) give math for those experiments results

Bjerknes has a great deal of difficulty with accepting (a) and (b) as both valid. Its all this fuss over what he thinks is the *Petitio Principi mistake*. As pointed out earlier I argue in other papers that there are problems with claiming experiments give results that become postulates (1) and (2); if there was not this problem and we had scenario (a) and (b) without that difficulty; then it would be circular as he claims. But what we would really have is the math by (a) and (b) being the same (if no other mistakes) and that would show consistency. So in that sense circular reasoning would be a virtue in showing looking at it both ways gives same result.

Proceeding:

Bjerknes: [...] Einstein[...] phrased [...] two "postulates", as follows:

Einstein: "1 (a). Examples of a similar kind, as well as the failed attempts to find a motion of the earth relative to the 'light medium', lead to the supposition, that the concept of absolute rest corresponds to no characteristic properties of the phenomena not just in mechanics, but also in electrodynamics, on the contrary, for all systems of coordinates, for which the equations of mechanics are valid, the same electrodynamic and optical laws are also valid, as has already been proven for the magnitudes of the first order.

me: no absolute rest by the relativity principle.

Einstein: 1 (b). The laws according to which the states of physical systems change do not depend upon to which of two systems of coordinates, in uniform translatory motion relative to each other, this change of state is referred.

me: bit more dubious, but might still be relativity principle; needs more clarification.

Einstein: 2 (a). [L]ight in empty space always propagates with a determinate velocity c irrespective of the state of motion of the emitting body.

me: Now this is the lightspeed invariance postulate.

Einstein: 2 (b). Every ray of light moves in the 'resting' system of coordinates with the determinate velocity c , irrespective of whether this ray of light is emitted from a resting or moving body. Such that

$$\text{velocity} = (\text{path of light}) / (\text{interval of time}) ,$$

where 'interval of time' is to be construed in the sense of the definition of § 1."

me: this is lightspeed invariance postulate again. The trouble here with Einstein is it's not really very clearly defined these (1a)-(2b), but I deal with the ambiguity of Einstein in other papers. What Bjercknes picks up from these statements from Einstein is--

Bjercknes: Note that the first "postulate", the principle of relativity, refers only to "moving systems" and the second "postulate", the light "postulate", refers only to a proposed "resting system".

me: that is possible, Einstein is ambiguous as far as I am concerned, and maybe he meant what Bjercknes claims.

Bjercknes Note further, that the light "postulate" refers only to a proposed source independence of light speed, but not to an observer independence, because this "postulate" assumes a prior privileged frame and medium in the 1905 paper, the "resting system". The paper later presumes that $c' = c \pm v$, relative to the "resting system".

me: So Bjercknes interprets that Einstein still uses Newtonian velocity addition when he says $c' = c \pm v$. I think that very good, and I would like to interpret Einstein that way, but unfortunately things do get messed up by Einstein with his math.

Bjercknes: Many assert that [...] Einstein[...] employed only these two "*a priori* postulates" in their theorization, as opposed to FitzGerald, Larmor, Lorentz, and Poincaré, who required the additional hypotheses of length contraction and time dilatation *to arrive at the same formulation - long before the Einstein[...].*

me: It is false claims are made that Einstein got his results from just two postulates; the math of SR does not follow from just two postulates; as I dealt with in other papers.

Bjercknes: *Ad hoc* hypotheses were frowned upon at the time, due to Newton's admonitions against them, such that the removal of hypotheses was seen as an improvement. The two postulate myth is substantially and demonstrably false.

me: exactly, but the two postulate myth is what is often taught.

Bjercknes: The two postulates are not postulates, but rather are the deduced conclusions of the theory - summations of the supposedly observed phenomena of the day.

me: that's swapping things around; changing conclusions with starting assumptions; and I dealt with issues around that earlier.

Bjerknes: After asserting the two "postulates", [...] Einstein[...] raised a straw man argument based a *non sequitur*. [...] asserted that the two "postulates" appeared irreconcilable with each other. If light speed is constant in the "resting system", then how can it also be isotropic in a "moving system"? This is a (manufactured) dilemma, because, in some inexplicable way, [...] Einstein[...] argue that the first postulate, the principle of relativity, compels that light speed from a given light signal be isotropic for all systems in uniform motion with each other. However, this is clearly a *non sequitur*, because the principle of relativity no more compels light speed isotropy for all "moving systems", then [means "than"] the principle of relativity requires that a body resting relative to one "moving system" k also rest relative to another "moving system" K , which is in motion relative to the first. Einstein also raised the opposing problem. How can light speed be isotropic in the "resting system" and also be isotropic in a "moving system"? Of course, these questions presume the conclusion before it has been proven, the conclusion being that light speed from any given signal is isotropic in the "resting system" and all "moving systems", which are in uniform translatory motion with respect to the "resting system".

me: exactly, Einstein made a mess.

Bjerknes: To knock down these straw men, [...] Einstein[...] turned the "two postulates" into one "postulate", the conclusion which is sought. [...] Einstein[...] asserted that it is the *combination* of the two postulates, not either postulate by itself, which "deduces" $c' = c$ between the moving system and the resting system, by simply asserting that $c' = c$,

me: also note this now goes against Einstein's earlier noted use of Newtonian velocity addition; he (Einstein) wants things both ways—he wants his cake and eat it too.

Bjerknes:...before it has in any way been proven:

Einstein: "It is easy, with the help of this result, to ascertain the magnitudes ξ, η, ζ because one expresses by means of these equations, that light (as the principle of the constancy of the velocity of light, in conjunction with the principle of relativity, requires) also propagates with the velocity c as measured in the moving system."

Bjerknes : After irrationally presuming this conclusion, [...] Einstein[...] proceeded to pretend that they had not presumed it:

me: exactly, the Einstein paper was mostly nonsense, but since math is beyond most people's comprehension, to cloak nonsense with math and it deceives a lot of those people.

Einstein: "Now, we have to prove that every ray of light propagates with the velocity c as measured in the moving system, in case this is, as we have taken for granted, the case in the resting system, because we still have not offered up the proof that the

principle of the constancy of the velocity of light is reconcilable with the principle of relativity."

Bjerknes : However, the combination of the two postulates induces $c' = c \pm v$, not $c' = c$.

me: Exactly, Einstein has nonsense – first the math is one way then it's the other way. He effectively has $1 + 1 = 2$ one moment then alternates this with using $1 = 2$.

Bjerknes: One must take the supposed empirical phenomenon of $c' = c$ as a point of departure for an inductive analysis, not a deductive synthesis, to induce a fundamental geometry, which fundamental geometry then deduces the identity $c' = c$ and the covariance of the laws of physics, as a synthetic theory.

Bjerknes :]Einstein[.] averred, before any proof was offered:

Einstein: "It is easy, with the help of this result, to ascertain the magnitudes ξ, η, ζ because one expresses by means of these equations, that light (as the principle of the constancy of the velocity of light, in conjunction with the principle of relativity, requires) also propagates with the velocity c as measured in the moving system. For a ray of light emitted in the direction of increasing ξ at the time $\tau = 0$, the following equations are valid:

$$\xi = c \tau \dots"$$

Bjerknes : Note the *non sequitur*, which begs the question: That allegedly if the speed of light is c in the "resting system" the principle of relativity compels that it also be c in the "moving system"; which, without the prior hypotheses of the Lorentz Transformation, clearly is not a rational conclusion, for if I rest in the resting system, the principle of relativity does not compel that I also rest in the moving system. Rather, [...] Einstein[...] simply confused their conclusion as an additional premise, which renders the two "postulates" redundant, or renders one postulate deducible from the other, and in no sense a postulate.

me: the relevant word is "confused", the Einstein paper is a confused mess.

Bjerknes: As Einstein, himself, avowed, "the real basis of the special relativity theory" is not the conclusion of light speed invariance and the covariance of the laws of physics in Lange's "inertial systems". As Albert Einstein later admitted, the real set of *a priori* postulates is the "Lorentz Transformation", replete with its dreaded *ad hoc* hypotheses. The Lorentz Transformation deduces all velocity comparisons, not just invariant light speed, which is a specific speed, and a derived unit, not a general geometry.

me: Einstein just kept changing his mind which leads to extra mess.

Bjerknes: Later formulations of the special theory of relativity change the 1905 light postulate, from the Einstein[...] constant speed of light exclusively in the "resting system", into the invariance of light speed in all of Lange's inertial systems.

me: i.e. Special Relativity is changed to something other than what it was originally; this creates even more mess.

Bjerknes: But this renders the principle of relativity redundant to, or deducible from, the light "postulate", and, therefore, not a "postulate", *per se*, because the light "postulate" then asserts the identity of Lange's inertial systems as light speed invariance, and the principle of relativity is already proven in the light "postulate". On the other hand, if we pretend that the principle of relativity is the covariance of the laws of physics embracing Maxwell's theory, given the "Lorentz Transformation" as a premise, then the second "postulate" is already incorporated in the first "postulate".

me: Exactly, even the 2 postulates of which Special relativity is based becomes now a confused mess as to what they are supposed to really mean with Einstein changing his mind and changing them to mean something else.

Bjerknes: If we are to assume that [...] Einstein[...], in their 1905 paper, deduced, not induced, the Lorentz Transformation from invariant light speed; we would further have to fallaciously assume that empirically observed Lorentz Transformation metrics provoked [...] Einstein[...] to induce an unobserved invariant light speed and the unobserved symmetry of phenomena, as self-evident general truths induced *a posteriori* from empirically observed and reciprocally measured: length contraction, time dilatation and relative simultaneity. Such is obviously not what happened, and such is not what is argued in the 1905 paper.

Bjerknes : On the contrary, supposedly observed invariant light speed and the supposedly observed symmetry of electrodynamic phenomena led Voigt [3], FitzGerald [4] and Larmor [5] to scientifically induce, *a posteriori*, the general geometry of the (misnamed) "Lorentz Transformation", which general set of hypotheses supposedly deduced all "known" phenomena in non-existent hypothetical "inertial systems".

me: I would dispute their math as well. Einstein was working from earlier sources, but he did not mention them in his 1905 paper, it was probably these people that Bjerknes mentions, and Einstein just took on these people's math mistakes to become his own.

[...]Einstein[...] pseudo-Metaphysics, their ontology of redundancy, simply disguised the more scientific, though likewise irrational, work of their predecessors, in a way which attempted to make it appear that [...]Einstein[...] had deduced that which must be induced, and had avoided hypotheses, which they had not avoided, but rather induced, through fallacy of *Petitio Principii*.

me: i.e Einstein made a mess which he took from his predecessors, but on the issue of *Petitio Principii* (circular); it would have been alright to show circular reasoning – that the math was consistent from looking at it from both directions from assumptions to consequences and from consequences to assumptions; except that the math had already been messed up.

Bjerknes : Most of the post-1905 statements of the special theory of relativity substitute a completely different proposition for the "two postulates". Einstein, himself, substituted one light theorem, in 1907, for the "two postulates" of 1905:

"the 'principle of the constancy of the velocity of light' [***] for a system of coordinates in a definite state of motion [as opposed to solely in the 'resting system' as in 1905.]" [6]

me: i.e. changing what he (Einstein) meant for lightspeed constancy in 1907 from what meant in 1905.

Bjerknes:..which presumes the Lorentz Transformation from which this "postulate" is deduced, and which presumes the tacit hypotheses of an isotropic and homogenous absolute space [7] and "a definite state of motion" relative to that absolute space. This new light "postulate" represents, therefore, not a postulate, but a deduction, a theorem, and a phenomenon.

me: and hence more mess from Einstein.

Bjerknes : Einstein admitted, in 1907, that this "postulate" could not be *a priori*, but must, instead, be *a posteriori*:

Einstein: "That the supposition made here, which we want to call the 'principle of the constancy of the velocity of light', is actually met in Nature, is by no means self-evident, nevertheless, it is - at least for a system of coordinates in a definite state of motion - rendered probable through its verification, which Lorentz' theory based upon an absolutely resting aether has ascertained through experiment." [8]

me: yes so he swapping things around again, which would be okay as far as I am concerned, but really the supposed math with this is a mess, but dealt with in my other papers.

Bjerknes: The so-called "postulates" are simply a restatement of supposed experimental facts, and are not postulates, but empirical facts generalized as "laws" and "theorems".

me: I would add that the postulates being in a mess are confused interpretations of empirical facts.

Bjerknes : As Robert Daniel Carmichael stated:

Carmichael: "The experiments which we have described (and others related to them) are fundamental in the theory of relativity. The postulates in the next chapter are based on them. These postulates are in the nature of generalizations of the facts established by experiment. [***] In the next chapter we shall begin the systematic development of the theory of relativity. It will be seen that its fundamental postulates,

or laws, are based on the experiments of which we have given a brief account and on others related to them. [***] The postulates, as we shall see, are simply generalizations of experimental facts; and, unless an experiment can be devised to show that these generalizations are not legitimate, it is natural and in accordance with the usual procedure in science to accept them as 'laws of nature.'" [9]

Bjerknes :H. A. Lorentz questioned Albert Einstein's "method" of pretending that induction is deduction:

Lorentz: "Einstein simply postulates what we have deduced, with some difficulty and not altogether satisfactorily, from the fundamental equations of the electromagnetic field. [***] I have not availed myself of his substitutions, only because the formulae are rather complicated and look somewhat artificial". [10]

me: In hindsight Lorentz should have been stronger with his criticism of Einstein.

Bjerknes : We soon discover in the introduction of the Einstein [...] 1905 paper a clear statement of the fallacious objective of their entire paper:

Einstein: "These two assumptions are sufficient in order to arrive at a simple and consistent electrodynamics of moving bodies, taking as a basis Maxwell's theory for resting bodies."

Bjerknes: Is Maxwell's theory for resting bodies a third postulate?

me: In other words – does a certain interpretation of Maxwell's theory have to be taken, making it an extra assumption. Einstein was of course unclear on this. Einstein seems to have misinterpreted Maxwell's theory. So what is meant by “taking as basis Maxwell's theory for resting bodies” – is unclear as to whether it applies to just one reference frame or to all of them etc.

Bjerknes: One of the "two assumptions", the first "postulate", is that the laws of electrodynamics of moving bodies be consistent among systems of reference in uniform translatory motion with respect to the "resting system". Of course, the reasoning presented is circular, first assuming via the first "postulate" that the laws of electrodynamics are consistent, then arguing that this mandated consistency, as a premise, causes consistency as an effect.

me: once again Bjerknes protests at the circular reasoning.

Bjerknes: It is the first of many circular arguments found in the Einsteins' 1905 paper. How do we determine that which constitutes an "inertial system", other than circularly, as in: An inertial system is one in which there is no net force acting on the system; there is no net force acting on a system, when it is inertial?

me: Exactly, circular reasoning for inertial frame; its more a definition; but then Einstein is in a mess and that's all unclear.

Bjerknes: Maxwell's theory for resting bodies is Maxwell's theory of the medium, a privileged frame, the aether.

me: Exactly, and from that interpretation the math of Maxwell's theory would be altered for the other frames.

Bjerknes : However, [...] Einstein[...] alleged that the aether was "superfluous" to their theory. [...] Einstein[...] irrationally wrote with the same pen that the aether was superfluous, while asserting it as a basis for their theory.

me: This is identifying the privileged frame with the aether; actually there is several concepts muddled together here. The privileged frame is not superfluous by relativity principle so long as not absolute rest, it is absolute rest that does not exist. But the point is that Einstein had a certain interpretation of Maxwell's theory which was not really there in Maxwell's theory. And it should have been an issue as to whether Einstein's version of Maxwell's theory is correct (i.e his alteration of it). I say its not, that Maxwell's theory should be made consistent with Newtonian physics. But Einstein went the other way- alter Newtonian physics to his version of Maxwell's theory.

Bjerknes : In the introduction to the 1905 paper, we are being primed to venture forth from Maxwell's theorems for bodies resting in the aether, so that we can return to them, *Petitio Principii*, as the covariant laws of moving bodies, while being asked to pretend that the aether is superfluous, so that we aren't too shocked when simultaneity is claimed to be relative, again, *Petitio Principii*, via an impossible light synchronization *assumption* of light speed invariance, or $c' = c$, which *premise* is also the *conclusion* of the theory.

me: in other words the circular thinking of Einstein was creating a mess. Circular reasoning is not bad in itself as far as I am concerned so look as its used properly, but Einstein was just making a mess with it.

me: Bjerknes now shows how Einstein changes his mind on things-

Bjerknes: For example, Albert Einstein stated in 1949:

Einstein: "[T]he following postulate is [***] sufficient for a solution [***] *L-principle holds for all inertial systems* (application of the special principle of relativity to the L-principle) [***] With the help of the Lorentz transformations the special principle of relativity can be expressed thus: The laws of nature are invariant with respect to Lorentz-transformations". [11]

Bjerknes: Compare Albert Einstein's later statement to Willem de Sitter's statement of 1911:

Einstein: "The principle of relativity can be enunciated as the postulate that the transformations, with respect to which the laws of nature shall be invariant, are 'Lorentz-transformations.'" [12]

Bjerknes : Einstein, [...] stated in 1952:

Einstein: "The whole content of the special theory of relativity is included in the postulate: The laws of Nature are invariant with respect to the Lorentz

transformations." [13]

me: Next – Bjercknes think he shows Einstein admitting to plagiarism. I will analysis and show that as wrong-

Bjercknes: Einstein disclosed his *modus operandi* for manipulating credit for the synthetic theories of others, when he stated in 1936:

Einstein: "There is no inductive method which could lead to the fundamental concepts of physics. Failure to understand this fact constituted the basic philosophical error of so many investigators of the nineteenth century. [***] Logical thinking is necessarily deductive; it is based upon hypothetical concepts and axioms. How can we expect to choose the latter so that we might hope for a confirmation of the consequences derived from them? The most satisfactory situation is evidently to be found in cases where the new fundamental hypotheses are suggested by the world of experience itself." [14]

me: Bjercknes tries to read into this something that is not there.

Bjercknes : This is a clear statement by Einstein that he would have science deduce a thing from itself, taking the world of experience as a hypothesis, only to deduce the world of experience as an effect, of itself. Of course, [....] Albert [... was] forced to present the real hypotheses, which [...he] stuck in the middle of [..the] arguments by way of induction, or an attempt at induction, which analyses [..he] attempted to disguise as deductions from *a priori* principles, but which "*a priori* principles" were well-known summations of phenomena.

Bjercknes : Einstein wanted people to believe that it is irrelevant that his predecessors induced the theories he later copied, because Einstein just invented them, *sua sponte*, irrationally, after he had read them, and therefore deserved credit for them:

Einstein: "Invention is not the product of logical thought, even though the final product is tied to a logical structure." [15]

me: Sua Sponte derived from Latin means "of one's own will". So tearing the statement "Einstein wanted people to believe that it is irrelevant that his predecessors induced the theories he later copied, because Einstein just invented them, *sua sponte*, irrationally, after he had read them.." apart it means –

Bjercknes : Einstein wanted people to believe that it is irrelevant that his predecessors induced the theories

me: this is a claim by Bjercknes and in no way shown by the earlier quote of Einstein, where Einstein just seems to be philosophising about method.

Bjercknes: ..he later copied,

me: another claim by Bjercknes and similarly no evidence for from what Einstein said.

Bjercknes : ...because Einstein just invented them, *sua sponte*,

me: meaning he (Einstein) created the theory SR by himself; it is certainly the case that it is often presented that Einstein created his SR from his own initiative in 1905 because his paper gives no references to earlier sources for his ideas.

Bjercknes : ... irrationally,

me: I agree with that, the process that Einstein used to create SR was a mess/

Bjercknes : ...after he had read them

me: it is a lot harder to prove one way or the other what Einstein read.

me: it's a pity that Bjercknes starts making claims beyond what the evidence can show.

Bjercknes: Einstein stated, together with Infeld:

Einstein and Infeld: "Physical concepts are free creations of the human mind, and are not, however it may seem, uniquely determined by the external world." [16]

Bjercknes : Certainly, the two "postulates" of the theory of relativity were *not*, "free creations of the human mind," but were, instead, summations of the empirical observations of the well-known phenomena of the day framed with the familiar concepts of the day.

me: dealt with earlier – the constancy of lightspeed assumption was an interpretation of experiment, and experiments could be interpreted in different ways; this is probably what Einstein meant by “free creations of the human mind” – that the human mind could interpret the experiments in different ways. Bjercknes has difficulty with trying to understand what Einstein meant by it as he says--

Bjercknes : What Infeld and Einstein meant by "free" is difficult to fathom, and it is simply repetitive to say that creations of the mind are creations of the mind.

me: but the “free” bit was supposed to mean could create different creations.

Bjercknes: Einstein's vague notions are perhaps the result of his [... influence from] Newton, Mach, Pearson, and others, on the principle of logical economy and watering down what they had written with Einstein's simplistic and naïve talk.

me: Bjercknes says “plagiarised” – which is once again not proven; so I changed it to “influence from” . It may be Einstein’s vague notions come from such sources, but once again its difficult to establish.

Bjerknes: If "free" is to mean unrestricted in any sense, no human mind is "free". We are limited in our concepts, experience, and scope, and we are socialized, indoctrinated and inculcated into certain beliefs.

me: Einstein is usually presented as a genius that broke away from such conditioning by society and decided to think of things afresh; in that sense "free".

Bjerknes : Despite Einstein's assertions, there is no mutual exclusion between being creative and being logical. One can create logical hypotheses through creative induction.

me: maybe

Bjerknes : It is the Lorentz Transformation which is the product of creative inductive logic, with its hypotheses of length contraction, time dilatation and relative simultaneity, and which is the fundamental postulate of the special theory of relativity.

me: all that is supposed to be credited to Einstein, with only parts of those ideas fragmented among others, and Einstein bringing them altogether in one package. That package is a mess.

Bjerknes: Invariant light speed and the covariance of the laws of physics are deducible from the Lorentz Transformation, the laws of physics, and the definition of inertial motion, which are more fundamental in the special theory of relativity, than invariant light speed.

me: all that is a mess

Bjerknes: Speed must be composed of the more fundamental elements of distance and duration. Speed is a derived unit. Therefore, the synthesis of the special theory of relativity comes in deducing invariant light speed from the hypotheses of an isotropic and homogenous space, Maxwell's theory of the medium, the theory of inertial motion, and the hypotheses of length contraction, time dilation and relative simultaneity. This is precisely the conclusion Einstein was obliged to admit, in 1935:

Einstein: "The special theory of relativity grew out of the Maxwell electromagnetic equations. So it came about that even in the derivation of the mechanical concepts and their relations the consideration of those of the electromagnetic field has played an essential role. The question as to the independence of those relations is a natural one because the Lorentz transformation, the real basis of the special relativity theory[. . .]"[17]

Bjerknes : To argue, as [...] Einstein[...] did argue in 1905, that invariant light speed and the mandated identity of Lange's inertial systems deduces invariant light speed and the mandated identity of Lange's inertial systems, is to argue in fallacies of *Petitio Principii*, which the Einsteins did do, in an attempt to hide their [...]sources...] of the induced hypotheses of Boscovich, Voigt, FitzGerald and Larmor.[18]

me: Maybe. As far as I am concerned the sources of Einstein have not be properly admitted to by the mainstream; so I substituted "sources" for Bjercknes' use of word "plagiarism". Many of Bjercknes valid points just get swamped under his prejudice of wanting to believe in plagiarism, when he can't really present real evidence for, other than trying to re-interpret what Einstein says as admission to plagiarism when there is no such thing in what's really being said.

Removing the unfounded plagiarism accusation, an interesting point becomes how much we should consider Einstein's SR as being Einstein's. In 1905 Einstein supposedly derived the math of the Lorentz transformations, then later decided that the math of Lorentz transformations was more important than the derivation of it; presumably because he might then have thought the derivation flawed. If the math of Lorentz's transformation was more important, then since Lorentz stated that math before Einstein, and from that perspective the theory is more properly Lorentz as the originator instead of Einstein. However, Lorentz was working from earlier math, so the originator of the theory becomes more obscure from that perspective. [5a] Einstein as mainstream sometimes likes to say combined relativity to the math setup; that might make the theory his; but was he first to do so is also problematic. [6a]

Whereas on the physics issues - what we have highlighted here is difficulty in understanding Einstein by Bjercknes, in large part due to the mess Einstein made. Showing how many attempts by various people to sort out Einstein's mistakes are sent the wrong way.

Bjercknes references:

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2 - H. A. Rowland, *The Physical Papers of Henry August Rowland*, The Johns Hopkins Press, Baltimore, Maryland, (1902), pp. 673-674.

3 - W. Voigt, "Ueber das Doppler'sche Princip", *Nachrichten von der Königlichen Gesellschaft der Wissenschaften und der Georg-Augusts-Universität zu Göttingen*, (1887), pp. 41-51; republished *Physikalische Zeitschrift*, Volume 16, Number 20, (October 15, 1915), pp. 381-386; English translation, as well as very useful commentary, are found in A. Ernst and Jong-Ping Hsu (W. Kern is credited with assisting in the translation), "First Proposal of the Universal Speed of Light by Voigt in 1887", *Chinese Journal of Physics* (The Physical Society of the Republic of China), Volume 39, Number 3, (June, 2001), pp. 211-230; URL <http://psroc.phys.ntu.edu.tw/cjp/v39/211.pdf> Lorentz acknowledged Voigt's priority, and suggested that the "Lorentz Transformation" be called the "Transformations of Relativity": See: H. A. Lorentz, *Theory of Electrons*, B. G.

Teubner, Leipzig, (1909), p. 198 footnote; and H. A. Lorentz, "Deux memoirs de Henri Poincaré", *Acta Mathematica*, Volume 38, (1921), p. 295; reprinted in *Œuvres de Henri Poincaré*, Volume XI, Gautier-Villars, (1956), pp. 247-261. Minkowski also acknowledged Voigt's priority: See: *The Principle of Relativity*, Dover, New York, (1952), p. 81; and *Physikalische Zeitschrift*, Volume 9, Number 22, (November 1, 1908), p. 762. For further discussion of Voigt's relativistic transformation, see: R. Dugas, *A History of Mechanics*, Dover, New York, (1988), pp. 468, 484, 494; A. Pais, *Subtle is the Lord*, Oxford University Press, Oxford, New York, Toronto, Melbourne, (1982), pp. 121-122.

4 - G. F. FitzGerald, "The Ether and Earth's Atmosphere (Letter to the Editor)", *Science*, Volume 13, Number 328, (1889), p. 390.

5 - J. Larmor, "A Dynamical Theory of the Electric and Luminiferous Medium", *Philosophical Transactions of the Royal Society of London A*, Volume 185, (1894), pp. 719-822; Volume 186, (1895), pp. 695-743; Volume 188, (1897), pp. 205-300; and *Aether and Matter*, CUP, (1900).

6 - A. Einstein, "Über das Relativitätsprinzip und die aus demselben gezogenen Folgerung", *Jahrbuch der Radioaktivität und Elektronik*, Volume 4, (1907), pp. 411-462, at 416.

7 - See: A. Pais, *Subtle is the Lord*, Oxford University Press, Oxford, New York, Toronto, Melbourne, (1982), p. 142; where Pais refers to Einstein's so-called "Morgan manuscript" of 1921. Einstein [..source for this..] from: N. R. Campbell, "The Common Sense of Relativity", *Philosophical Magazine*, Series 6, Volume 21, Number 124, (April, 1911), pp. 502-517, at 505. See also: R. D. Carmichael, "On the Theory of Relativity: Analysis of the Postulates", *The Physical Review*, First Series, Volume 35, (September, 1912), pp. 153-176; and "On the Theory of Relativity: Mass, Force and Energy", *The Physical Review*, Series 2, Volume 1, (February, 1913), pp. 161-197.

8 - A. Einstein, "Über das Relativitätsprinzip und die aus demselben gezogenen Folgerung", *Jahrbuch der Radioaktivität und Elektronik*, Volume 4, (1907), pp. 411-462, at 416.

9 - R. D. Carmichael, *The Theory of Relativity*, Mathematical Monographs No. 12, John Wiley & Sons, Inc., New York, Chapman & Hall, Limited, London, (1920), pp. 13-14.

10 - H. A. Lorentz, *The Theory of Electrons*, Dover, New York, (1952), p. 230.

11 - A. Einstein, *The Theory of Relativity and other Essays*, Carol Publishing Group, (1996), pp. 6-8.

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- 13 - A. Einstein, *Relativity, the Special and the General Theory*, Crown Publishing, Inc., New York, (1961), p. 148.
- 14 - A. Einstein, *Ideas and Opinions*, Crown Publishers, Inc., New York, (1954), p. 307.
- 15 - A. Einstein, quoted in A. Pais, *Subtle is the Lord*, Oxford University Press, Oxford, New York, Toronto, Melbourne, (1982), p. 131.
- 16 - A. Einstein and I. Infeld, *The Evolution of Physics*, Simon & Schuster, New York, London, Toronto, Sydney, Tokyo, Singapore, (1966), p. 31. Compare to the more lucid, prior statements of: W. K. Clifford, *The Common Sense of the Exact Sciences*, Dover, New York, (1955), pp. 193-194. E. Mach, "The Economy of Science", *The Science of Mechanics*, Open Court, LaSalle, Illinois, (1960), pp. 577-595. K. Pearson, *The Grammar of Science*, Second Revised and Enlarged Edition, Adam and Charles Black, London, (1900), pp. 30-37. H. Poincaré, *Dernières Pensées*, Flammarion, Paris, (1913); English translation *Mathematics and Science: Last Essays*, Dover, New York, (1963), pp. 22-23. [...]
- 17 - A. Einstein, "Elementary Derivation of the equivalence of Mass and Energy", *Bulletin of the American Mathematical Society*, Series 2, Volume 41, (1935), pp. 223-230, at 223.
- 18 - Cf. C. J. Bjerknes, *Albert Einstein: The Incurable Plagiarist*, XTX Inc., Downers Grove, Illinois, USA, (2002), ISBN 0971962987.

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- [1a] Einstein's Irrational Ontology of Redundancy The Special Theory of Relativity and Its Many Fallacies of Petitio Principii , Christopher Jon Bjerknes
<http://itis.volta.alessandria.it/episteme/ep6/ep6-bjerk2.htm>
- [2a] Philosophy 103: Introduction to Logic Petitio Principii
 from: <http://philosophy.lander.edu/logic/circular.html>
- [3a] ON THE ELECTRODYNAMICS OF MOVING BODIES By A. Einstein
 June 30, 1905, <http://www.fourmilab.ch/etexts/einstein/specrel/www/>
- [4a] One could look at things like "Einstein's Wife" Andrea Gabor, Penguin books, 1995; if one wants to consider the possibility that Einstein's wife co-authored with Einstein in 1905.
- [5a] History of Lorentz transformations, from from Wikipedia gives :” Early approximations of the transformation were published by Voigt (1887) and Lorentz (1895).” at 2010-08-10 so that’s a good place to start from.

[6a] Who Invented Relativity? <http://www.mathpages.com/rr/s8-08/8-08.htm>
says: "By 1905, Poincare had clearly articulated the principle of relativity and many of its consequences,.."

my comments c.RJAnderton 2010-08-10