Omissions in Special Relativity

Roger J Anderton (and Prof Dragoslav Stoiljkovich to some extent)

Talk for ANPA 2017

Slides from talk presented in August 2017 for

Alternative Natural Philosophy Association

Video at: https://www.youtube.com/watch?v=P5c3M_XIzeM

Outline

- This is a different talk than originally planned, and grew out of talking to Richard Amoroso
- He wanted me to talk in terms of “omissions” in translations, not as “mistranslations”
- So, I am going to try to talk of it in those terms of “omissions” in Special Relativity.
- And only now and again will I slip back to talk of “mistranslations”.

Quantum Jelly

- Geoffrey's talk last year at ANPA mentioned his idea of Quantum Jelly
- This prompted me to remember what I had read in a popular science magazine that I had read decades ago.
- The magazine was Science Digest
- It dealt with trying to understand science at a popular level.
- Such as the mystery of lightspeed (in Vacuum) constancy:
- How could light change its speed through different medium and still be said to have a constant speed.

FROM SCIENCE DIGEST LETTER PAGE MAY 1982

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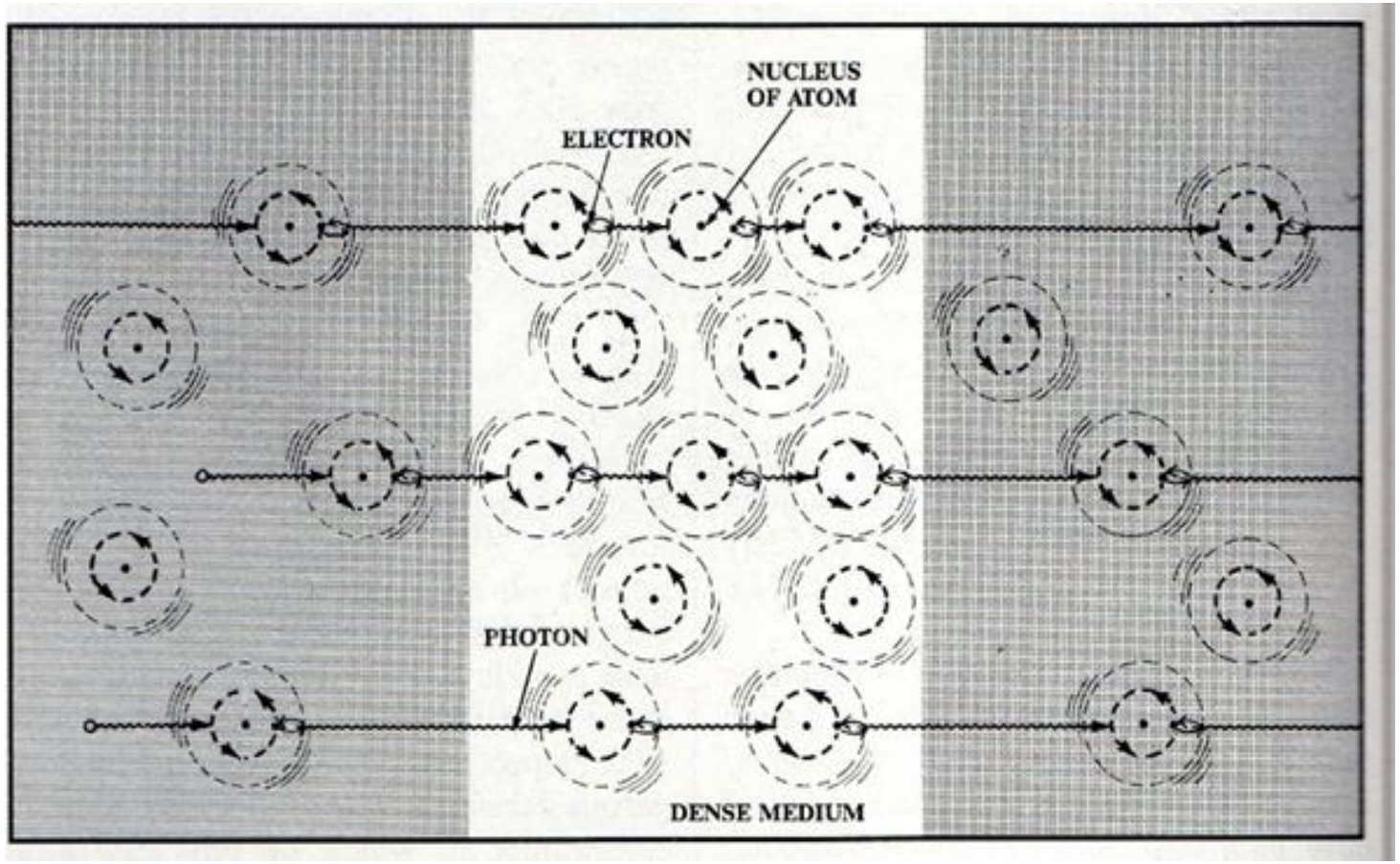
DOES LIGHT SLOW DOWN?

I would like to join the discussion of "How Heat Produces Mirages" [Letters, October 1981].

You explain that light traveling through a dense medium excites the molecules therein, causing them to radiate light energy. The time lag involved in the molecules being excited and emitting a new photon effectively slows down the entire wave packet.

If this is the case, then what accounts for the strange phenomenon of the beam of light resuming its original speed after leaving the medium through which it has traveled?

And the magazine answered with a diagram, which reminds me of Geoffrey's Quantum Jelly



The Newscience staff replies:
In modern quantum mechanics, light is thought to be composed of particles called photons that always *travel at the speed of light in a vacuum.*

When a photon strikes an atom, it is absorbed, causing one of the atom's electrons to jump to an unstable higher orbit, or energy level. When the electron falls back to its original, more stable orbit, a new photon is emitted—also traveling at the speed of light. In a dense medium (center section, diagram above), a photon is likely to strike more atoms—causing more delays—than in a sparse medium. Thus, a beam of light takes longer to travel through, although its photons travel at the speed of light. When it emerges, the photons face fewer delays.

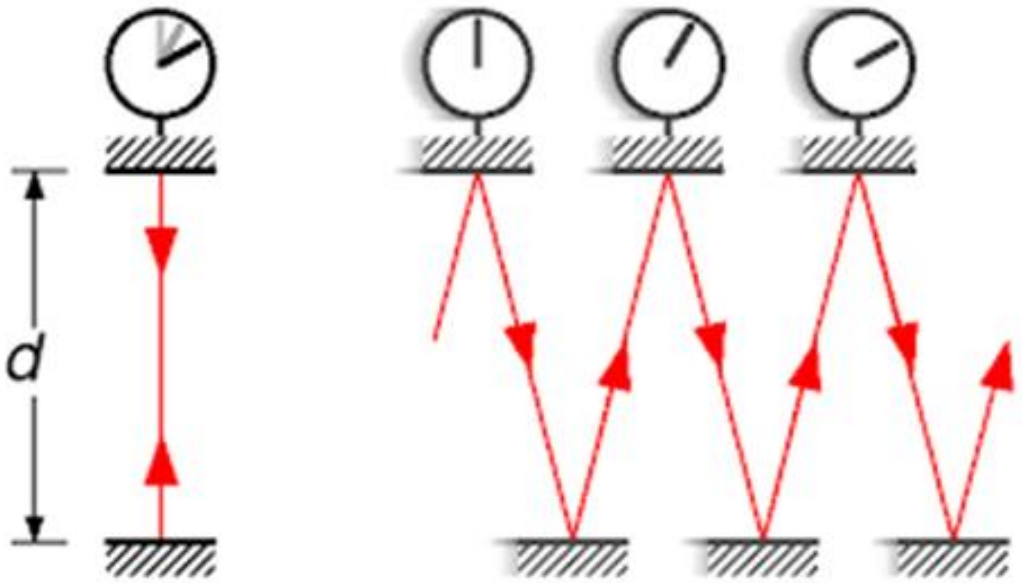
So, basically in Einstein's 1905 paper on Special Relativity:

- He wasn't considering Quantum effects (Quantum Mechanics not formulated until later in 1920s)
- It is fairly well known that Special Relativity is a classical theory in the sense that it does not consider/include Quantum mechanics.
- He had light travelling through a vacuum (idealised devoid of matter) and there was no quantum effect of interaction with other particles.
- I think the best way to describe it as: Einstein (1905) was dealing with a "classical vacuum" devoid of any matter particles. But Quantum Mechanics would consider a "quantum vacuum" that obeys Heisenberg Uncertainty and has virtual particles that pop in and out of existence.

But there are problems:

- When considering Quantum mechanics then you are bringing back a type of medium/ether; and that was something Special Relativity was excluding.
- Special Relativity is making the omission of Quantum mechanics; and that omission is including omission of ether with its preferred frame etc.
- With Michelson-Morley experiment and other experiments, Einstein's solution of Special Relativity seems to be an omission of these (above mentioned) things from what is dealt with in his mathematics.
- But then these omissions are something that get added back later in Quantum mechanics.
- So, its not a case of proving there is no ether, but more a case of just ignoring it temporally for the sake of certain experiments.

Now let’s consider how Special Relativity gets its mathematics: Light clock



Where light represented by a point-particle bouncing between mirrors.

There are some texts on relativity that go all the way back to basics, such as :

- A point particle is an idealized object that behaves in every way as a real object, except that it occupies no volume. Newton's laws of motion apply to the motions of point particles, and they describe the motion of real extended objects if these objects are treated as an assembly of interacting point particles.

- Ray Skinner, Relativity for scientists and engineers, Dover New York, 1969, 1982 p. 2

So, both Quantum mechanics and Einstein's relativity built from this idea of point-particles.

- But according to Modern Physics Establishment there are problems joining Quantum Physics with Einstein's (general) relativity
- The way that Einstein deals with point-particles seems peculiar
- i.e. there seems problem with how Einstein deals with point-particles and the way Quantum physics deals with point-particles
- I will call it: "Quantum point-particles" versus "classical point-particles"
- Where "classical point-particles" are particles that Special relativity deals with; in the sense that it does not deal with Quantum effects

Einstein never provided references (for his paper on relativity): The Nobel laureate for physics Max Born excellently resumed the impression that one receives when reading Einstein's paper for the first time:

[Einstein's] paper Zur Elektrodynamik bewegter Körper in Annalen der Physik [...] contains not a single reference to previous literature. It gives you the impression of quite a new venture.
http://www.pandualism.com/d/poincare.html

If Einstein had provided references then it would have been easier to check the context from which he was speaking

i.e. we have omissions from Einstein.

Max Born goes on to explain:

“It [Einstein’s relativity] gives you the impression of quite a new venture. But that is, of course, as I have tried to explain, not true.”

Physics in my Generation, p. 193 Max Born, London 1956

This issue of omissions was going to be addressed in a Physics conference of 1955, where Einstein was told that he would be asked about what influence Poincare had on him; questions raised by Whittaker's book: History of the theories of aether and electricity (1900-1926)

Unfortunately, Einstein did not live long enough to attend the conference. So, influences on Einstein is not properly resolved as far as I am concerned as to the context of what he was working from.

Ref: Einstein's Pathway to the Special Theory of Relativity, Galina Weinstein 2015 p 184-185

In Einstein's formulation of Special relativity we need his starting point. And that seems to be when he mentions Newtonian physics in his 1905 paper.

From: Zur Elektrodynamik bewegter Körper

Translation: Electrodynamics of moving bodies

Ref: https://biblio.wiki/wiki/Zur_Elektrodynamik_bewegter_K%C3%B6rper

Official translation seems to refer to it as: On the Electrodynamics of Moving Bodies

He says: Es liege ein Koordinatensystem vor, in welchem die Newtonschen mechanischen Gleichungen gelten. Wir nennen dies Koordinatensystem zur sprachlichen Unterscheidung von später einzuführenden Koordinatensystemen und zur Präzisierung der Vorstellung das „ruhende System“.

Translation: There is a coordinate system in which the Newtonian mechanical equations apply. We call this coordinate system a linguistic distinction between later-introduced coordinate systems and the definition of the "dormant system".

What we translate here as: “There is a coordinate system in which the Newtonian mechanical equations apply. “

Gets translated in the official version of Einstein’s paper of 1905 on Special Relativity (SR) “ON THE ELECTRODYNAMICS OF MOVING BODIES” on p.2 as:
“Let us take a system of co-ordinates in which the equations of Newtonian mechanics hold good.”

Which seems okay, but then a footnote is added to the English translation that is not in the original German version.

“Let us take a system of co-ordinates in which the equations of Newtonian mechanics hold good.”

But then it adds a footnote 2 says “i.e. to the first approximation.”

The footnote is not in the original German 1905 paper!

Also the Serbian translation (from the German) does not have it!

http://hermes.ffn.ub.es/luisnavarro/nuevo_maletin/Einstein_1905_relativity.pdf

based on the English translation of his original 1905 German-language paper which appeared in the book The Principle of Relativity, published in 1923 by Methuen and Company, Ltd. of London.

The footnote has been added by the Translator to try to make sense from the German as to what Einstein is saying:

So, we have the original German as near enough:

“Let us take a system of co-ordinates in which the equations of Newtonian mechanics hold good.”

But the English version has the footnote:

“i.e. to the first approximation.”

That is two different theories, and I contend that the original German theory is the one really meant. i.e. the English version of Einstein’s relativity has added something not in the original German “real” theory.

Details of this I shall now go into:

Now, going by Born: given that it wasn't a new venture

- It thus means was working from what others had done before.
- Therefore any deviation from how others before him were dealing with point-particles must most likely be a mistake.
- What we are presented is such equations as:

$$\Delta t' = \frac{\Delta t}{\sqrt{1 - \frac{v^2}{c^2}}}$$

- And told that as v tends to zero, then this approximates to Newtonian physics

I am going to drop the delta's

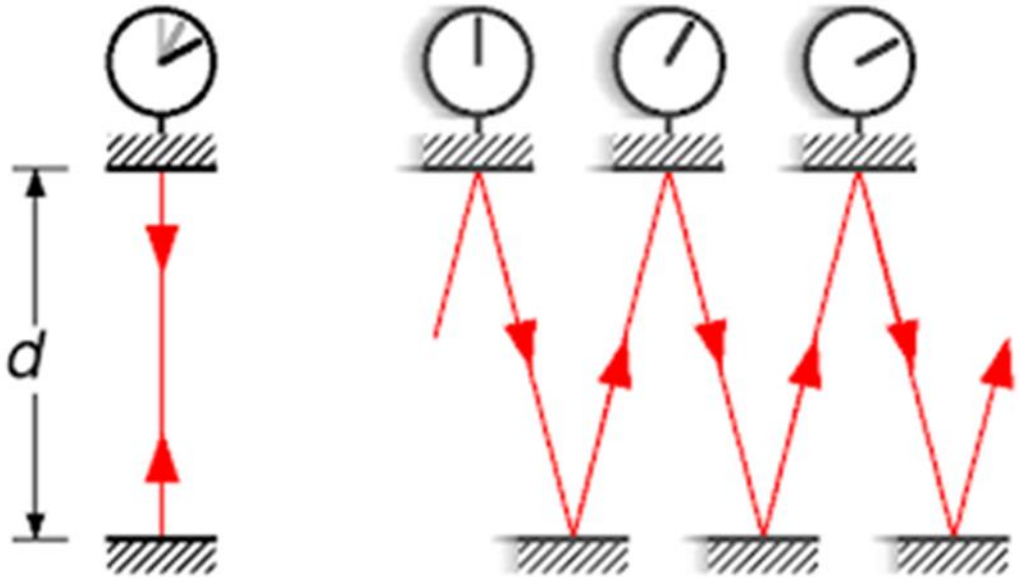
$$\Delta t' = \frac{\Delta t}{\sqrt{1 - \frac{v^2}{c^2}}}$$

So, going to write as: $t' = ((1- v^2/c^2)^{-1/2})t$

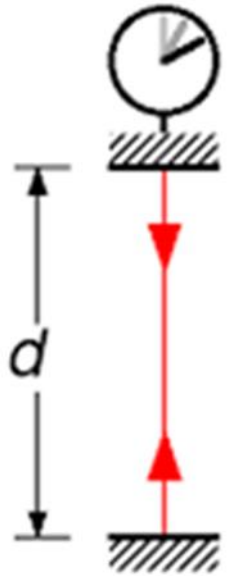
Delta's were being used to emphasise it was time intervals.

And its this equation being said to tend to Newtonian physics as approximation as v tends to zero

However, let’s look at the way the equation was obtained: Light clock



When light clock stationary



Where d = ct.

The thing to note is what is being dealt with is a point-particle moving the distance d in time t with speed c, so that d = ct

When light clock moving

And considering half of this triangle->

Hypotenuse= ct’
Horizontal = vt’
Vertical = $((c^2 - v^2)^{1/2})t'$
Also note we are dealing with point-particles with distance ct’ as distance point-particle travels in time t’ with speed c. Similarly for other distances.

Then equating the two verticals:

$((c^2 - v^2)^{1/2})t' = ct$

And re-arrange and we get the time dilation equation:

$t' = ((1 - v^2/c^2)^{-1/2})t$

What is to note is that: this equation was derived using Newtonian physics with point-particles (a la Newton and Boscovich)

So, the claim that

$t' = ((1- v^2/c^2)^{-1/2})t$

Reduces to Newtonian physics as v tends to zero is **FALSE**.

The equation itself is derived from Newtonian physics; and is hence a Newtonian equation. There is no reducing to Newtonian physics as v tends to zero, the equation is already part of Newtonian physics.

The context of how Einstein's relativity is to be understood has been falsely presented.

i.e. I am saying Relativity has been falsely translated on this.

Now, example of math problem in Einstein's papers:

- Einstein: "On the Influence of Gravitation on the Propagation of Light" Annalen der Physik, 35, pp. 898-908,1911, it has for equation:
- $c = c0(1 + \Phi/c^2)$
- Such publications as "Relativity, Gravitation, and Cosmology A basic introduction " by Ta-Pei Cheng has the correct equation (when bearing in mind different notation):
- $c = c0(1 + \Phi/c0^2)$
- Appears that just treating Einstein's writings as historic papers, leaving the mistakes in them.

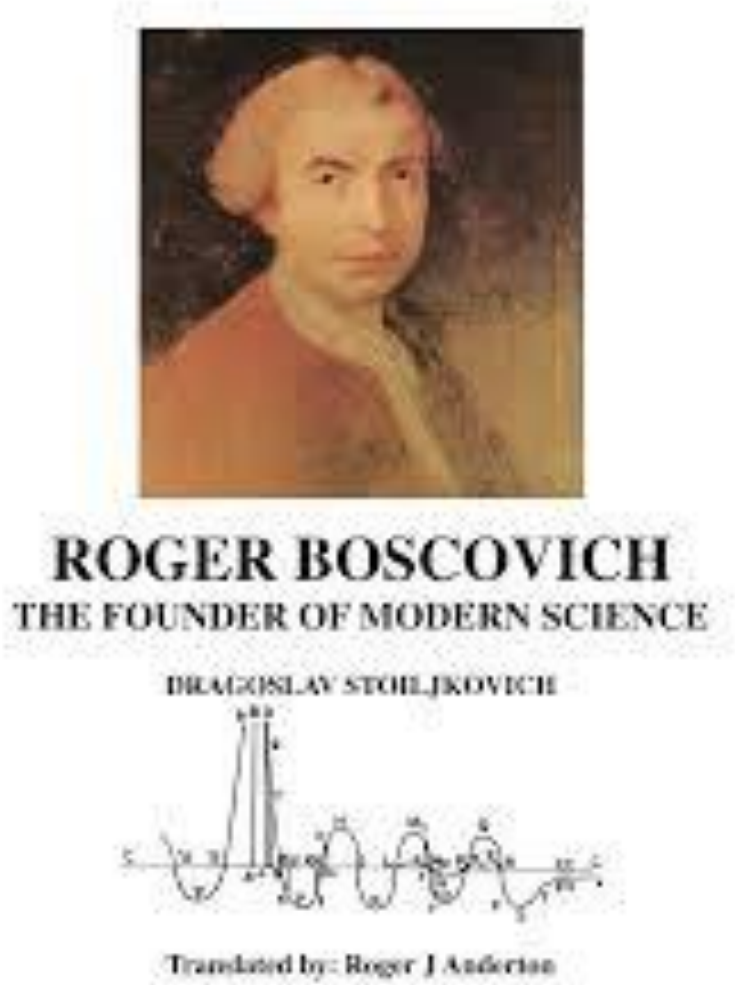
So, I contend:

There must be numerous problems in translation of how Relativity has been presented to us, and also numerous problems of mathematics mistakes in those papers.

And all of these things have been allowed to be left uncorrected!

So, trying to make sense of what we have been left with:

- Reminder about what was dealt with in an earlier talk on Boscovich's theory
- Professor Dragoslav Stoiljkovich has dealt with the issue of how modern Quantum mechanics was developed from the idea of classical physics (circa Boscovich 18th century): point-particles



Isaac Newton founded classical mechanics on the view that space is distinct from body and that time passes uniformly without regard to whether anything happens in the world. For this reason he spoke of absolute space and absolute time, so as to distinguish these entities from the various ways by which we measure them (which he called relative spaces and relative times).
Stanford Encyclopedia of Philosophy
https://plato.stanford.edu/entries/newton-stm/

But in the continuation of Newtonian physics under Boscovich there was further development on relationships between absolute and relative: space and time.

Under Lorentz it would then be t and t' as local times, with there still being a Newtonian universal time.

So, the context of equations like: $t' = ((1- v^2/c^2)^{-1/2})t$ has been false.

Einstein was dealing with classical point-particles in the sense that he was ignoring quantum effects.

But from the original consideration of classical point-particles they were leading to consideration of quantum effects (i.e. from considerations of Boscovich)

Newtonian research program:

Peter Godfrey Smith Theory and reality : an introduction to the philosophy of science p 102 “Newtonian research program of 18th century physics has Newton’s 3 laws and his gravitational law as its hard core”.

Boscovich with his work on point-particles that was continuation of Newtonian physics.

And Einstein is in a sense a continuation of Newtonian physics/Newtonian research program.

Alice Calaprice says:

- Einstein never became fluent in English, either written or spoken. In his day, the language of science was German, and there was no need for English until he went to the United States at the age of 54. If he was asked to speak formally or to write a letter or an article, he would first write a draft in German and then a colleague or secretary would translate it.
- Einstein's general theory of writing, Alice Calaprice, 2 April 2005 Guardian
- https://www.theguardian.com/books/2005/apr/02/featuresreviews.guardianreview36
- i.e. he seems to have left translation problem to others.

So, on the issue of translation when Einstein first talks of Newtonian physics in his paper on relativity, it should be translated as:

“Let us take a system of co-ordinates in which the equations of Newtonian mechanics hold good.”

Without the footnote.

The context is now that Einstein’s relativity is being dealt with in the context of Newtonian physics, and the thought that it is otherwise is a mistake made in translation.

Now, given that both Einstein’s relativity and Quantum mechanics are dealing with Boscovich’s theory of point-particles we have the common link between them.

Of course there are other problems with translation of Einstein etc. But we do now have the general outline of unification between relativity and quantum physics.

There are other issues in the Newtonian research program.

Because a lot of other things have been misrepresented: For instance in order to simplify Newton's theory of light it is often portrayed as solely a particle theory of light when actually its particles have wave properties. Thus the Newton particle theory of light versus Huygens wave theory of light was an artificial misrepresentation.

In Boscovich context would be a particle under influence of a field; which I think taken up by Bohm description of particle with pilot wave influencing it.

Conclusion so far:

It has not been properly appreciated the development of Newtonian physics (especially building on the concept of point-particles) to modern physics; and has often been misrepresented by mistakes in the mainstream narrative.

There is a more unified physics narrative that goes roughly like this:

Newton → Boscovich → Einstein → Bohm

There are of course other people of importance such as Galileo, Maxwell…
But what is generally missed out from the mainstream narrative is Boscovich, Bohm and others like them working on this type of unified field theory tradition.

I would finish here:

Except I could cause grief and talk about what I consider a new problem arising in physics:

I think there is a new type of problem in Physics arising:

- Whether Einstein actually said what he is claimed to have said.
- The well known saying is that Einstein claimed that introducing the cosmological constant was the greatest blunder he ever made.
- BUT he might never had said that (?)
- Mario Livio now tries to cast doubt on that.

- Ref:https://www.theatlantic.com/technology/archive/2013/08/einstein-likely-never-said-one-of-his-most-oft-quoted-phrases/278508/

According to Mario Livio

- He can’t find that saying in any of Einstein’s writings.
- He traces the source of that quote to physicist George Gamow
- It is supposedly what Einstein said to Gamow
- But Gamow was a Joker.
- So, was Gamow joking?
- How do we decide what Einstein actually said; do we have to go solely by what he wrote or do we allow what he supposedly said to others to stand as legitimate?

Problem:

- How do we accept anecdotal evidence.
- A lot of the evidence being presented to us as how to understand Einstein's relativity is anecdotal; supposedly what he said to various people.
- But when we go back to his writings we have problems with making sense of anything.
- The problem has affected Ivana Trump in the news recently of being accused of misquoting Einstein.

Einstein says: “Since the mathematicians have invaded the theory of relativity I do not understand it myself any more.” (hopefully a true quote?)

https://www.goodreads.com/quotes/78897-since-the-mathematicians-have-invaded-the-theory-of-relativity-i

- I think this quote (if true) indicates the problem was feeding back to him.
- He would be translated from German into English, and those people going by English were having a different interpretation of relativity to him.
- And that was then being fed back to him, hence the quote above.
- This translation problem from German →English is much more subtle that say from German → Japanese where initially Einstein’s relativity was very popular because it was thought he was talking about sex. (Probably, an exaggeration (?))
- Ref: Einstein's Mistakes: The Human Failings of Genius, Hans C. Ohanian p.265

The final thoughts I want to leave you with is:

- Relativity might have been about something other than what we commonly think it was about.
- Thankyou and Goodbye
- c.RJAnderton2017