

On why Einstein will never be wrong

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There is a great deal written about physics on the Internet which I disagree with; there is far too much to be able to go through it all. But for now I will go through an article by Brian Koberlein called “Why Einstein Will Never Be Wrong”.

Brian Koberlein [1] as his bio explains is an astrophysicist with a background in general relativity and computational astrophysics. He starts his article [2]:

“One of the benefits of being an astrophysicist is your weekly email from someone who claims to have “proven Einstein wrong”. These either contain no mathematical equations and use phrases such as “it is obvious that..”, or they are page after page of complex equations with dozens of scientific terms used in non-traditional ways. They all get deleted pretty quickly, not because astrophysicists are too indoctrinated in established theories, but because none of them acknowledge how theories get replaced.”

Which explains what happens to dissident thinkers (who are opposed to conventional science beliefs) when they try contacting mainstream scientists. Dissident thinkers such as from such groups as John Chappell Natural Philosophy Society. [3] In such societies there are varying ranges of academic skill; some dissidents being better qualified than others; but all seem to be wasting their time when trying to reach out to people like Brian Koberlein.

Brian Koberlein claims not to be “indoctrinated” but as go through his article, I think it reveals the opposite -> that he is indoctrinated; and I disagree with his representation of how “theories get replaced.”

Koberlein gives an example:

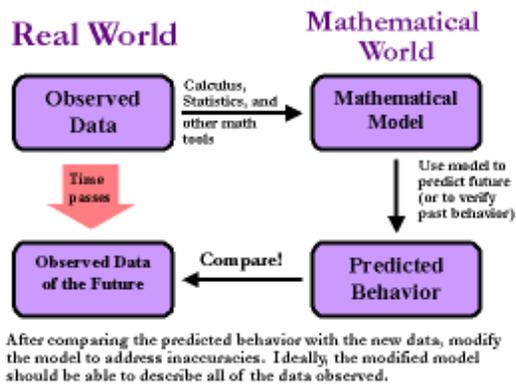
“For example, in the late 1700s there was a theory of heat known as caloric. The basic idea of caloric was that it was a fluid that existed within materials. This fluid was self-repellant, meaning it would try to spread out as evenly as possible. We couldn’t observe this fluid directly, but the more caloric a material has the greater its temperature.”

“From this theory you get several predictions that actually work. Since you can’t create or destroy caloric, heat (energy) is conserved. If you put a cold object next to a hot object, the

caloric in the hot object will spread out to the cold object until they reach the same temperature. When air expands, the caloric is spread out more thinly, thus the temperature drops. When air is compressed there is more caloric per volume, and the temperature rises.”

So, what he is describing at the moment is a theory (or better to call it a mathematical model) that works. When mathematics is applied to a theory it seems to create a mathematical model which has a range of applicability; where outside that range it is deemed not to work.

Mathematical modelling process can look like this [4]:



Where start from data collected from experiments and connect that data using mathematical equations, then try that mathematics to make predictions which is compared to experiments. An important step is the mathematical model is modified whenever necessary to fit experiments.

Koberlein continues:

“We now know there is no “heat fluid” known as caloric. Heat is a property of the motion (kinetic energy) of atoms or molecules in a material. So in physics we’ve dropped the caloric model in terms of kinetic theory. You could say we now know that the caloric model is completely wrong.”

A clear statement that the caloric model is wrong; but he immediately causes confusion when he next says:

“Except it isn’t. At least no more wrong than it ever was.”

So, he backtracks and is saying the caloric model is not wrong when he says “Except it isn’t”. And the confusing statement “At least no more wrong than it ever was.” -I think is his confusing way of referring to a mathematical model has a range of applicability. So, the caloric model has a range of applicability outside of which it doesn’t work.

He continues:

“The basic assumption of a “heat fluid” doesn’t match reality, but the model makes predictions that are correct.”

The caloric model “makes predictions that are correct” – so it is a mathematical model with a range of applicability.

While the claim “doesn’t match reality” – raises the question how does he know what reality is. In the case of the caloric model we have some mathematics that fits a certain range of data, then how that mathematics is interpreted in what it physically should be interpreted as meaning – I think too deep a philosophical question and pass. As for the question raised - of what is reality – Koberlein isn’t going to answer.

Koberlein continues:

“In fact the caloric model works as well today as it did in the late 1700s.”

So, he admits it works in its range of applicability.

Koberlein:

“We don’t use it anymore because we have newer models that work better. Kinetic theory makes all the predictions caloric does and more. Kinetic theory even explains how the thermal energy of a material can be approximated as a fluid.”

Note – what I pointed out earlier that mathematical models get modified; so, what we have here is a modified mathematical model of the “Kinetic theory” and it still approximates to caloric model. That is mathematical model update.

Koberlein:

“This is a key aspect of scientific theories. If you want to replace a robust scientific theory with a new one, the new theory must be able to do more than the old one. When you replace the old theory you now understand the limits of that theory and how to move beyond it.”

Which means that the mathematical model was updated to deal with extending the range of applicability.

Koberlein now leads up to Einstein, first dealing with Newton:

“In some cases even when an old theory is supplanted we continue to use it. Such an example can be seen in Newton’s law of gravity. When Newton proposed his theory of universal gravity in the 1600s, he described gravity as a force of attraction between all masses. This allowed for the correct prediction of the motion of the planets, the discovery of Neptune, the basic relation between a star’s mass and its temperature, and on and on. Newtonian gravity was and is a robust scientific theory.”

He says “robust”, in other words - mathematical model based on Newtonian physics is “robust” enough to be updated to fit new data.

Koberlein continues:

“Then in the early 1900s Einstein proposed a different model known as general relativity.”

This is where I start to disagree with him a lot. Is Einstein's general relativity giving us a new mathematical model compared to mathematical model from Newtonian physics, or not (?) To me – it looks like a Newtonian physics mathematical model that has been updated (that is barring all the mistakes I think Einstein made which I dealt with in other articles). So, its not a “different model” as far as I am concerned. Extend a mathematical model from Newtonian physics by treating time as a dimension to give a four dimensional geometry and go from Euclidean geometry to non-Euclidean geometry, with a few other mathematical manipulations and it is just looking a bit like Einstein's physics; so no change, just a mathematical model being updated.

He going to say what Einstein has is radically different to Newton:

“The basic premise of this theory is that gravity is due to the curvature of space and time by masses. Even though Einstein's gravity model is radically different from Newton's, the mathematics of the theory shows that Newton's equations are approximate solutions to Einstein's equations.”

But as far as I am concerned its not. Mathematicians when they start manipulating the mathematics for Newtonian physics. For example of what the mathematicians can do see: The WE-Heraeus International Winter School on Gravity and Light video lecture that tells us Newtonian spacetime is curved. [5]

Koberlein is just making more claims that are not substantiated; presumably those claims are based on his beliefs but based on him having inadequate knowledge about what the mathematicians are doing.

Koberlein continues:

“Everything Newton's gravity predicts, Einstein's does as well. But Einstein also allows us to correctly model black holes, the big bang, the precession of Mercury's orbit, time dilation, and more, all of which have been experimentally validated.”

Picking up on the black hole issue, it has problems. Black hole supposedly collapses to a singularity and often talked about as laws of physics break down there, so the mathematical model from Einstein needs extending in some way. Similarly, big bang has problems at the supposed moment of when the big bang started. Thus if Newton needed extending, then Einstein needs extending as well; and Einstein is not “experimentally validated” in the places where it has problems with singularity of blackholes and origin of universe.

Koberlein continues:

“So Einstein trumps Newton. But Einstein's theory is much more difficult to work with than Newton's, so often we just use Newton's equations to calculate things. For example, the motion of satellites, or exoplanets. If we don't need the precision of Einstein's theory, we simply use Newton to get an answer that is “good enough.””

Next what he says I disagree with:

“We may have proven Newton's theory “wrong”, but the theory is still as useful and accurate as it ever was.”

We have not proven Newton wrong, as I have pointed out Newton mathematical model can be extended, and doing the extension does not prove the theory wrong.

Next he says:

“Unfortunately, many budding Einsteins don’t understand this.”

Far as I am concerned he hasn’t understood.

He continues:

“To begin with, Einstein’s gravity will never be proven wrong by a theory. It will be proven wrong by experimental evidence showing that the predictions of general relativity don’t work.”

A statement that does not make sense. If there is a theory that predicts experimental evidence that general relativity can’t account for, then its that theory proving the other theory wrong; contrary to his claim -> “Einstein’s gravity will never be proven wrong by a theory”. However, as far as I am concerned -> Einsteinian theory will modified and updated same as Newtonian theory can be.

He continues:

“Einstein’s theory didn’t supplant Newton’s until we had experimental evidence that agreed with Einstein and didn’t agree with Newton.”

It didn’t “supplant”; people who believed it supplanted Newtonian theory just didn’t realise mathematical models based on Newtonian physics can be modified and manipulated to carry on working.

He continues:

“So unless you have experimental evidence that clearly contradicts general relativity, claims of “disproving Einstein” will fall on deaf ears.”

General relativity just gets modified and manipulated to fit whatever evidence is presented, same as what happens to Newtonian physics. The most famous example in general relativity is the cosmological constant; sometimes it is added to general relativity and others times it is taken away. [6]

Koberlein continues:

“The other way to trump Einstein would be to develop a theory that clearly shows how Einstein’s theory is an approximation of your new theory, or how the experimental tests general relativity has passed are also passed by your theory. Ideally, your new theory will also make new predictions that can be tested in a reasonable way. If you can do that, and can present your ideas clearly, you will be listened to. String theory and entropic gravity are examples of models that try to do just that. But even if someone succeeds in creating a theory better than Einstein’s (and someone almost certainly will), Einstein’s theory will still be as

valid as it ever was. Einstein won't have been proven wrong, we'll simply understand the limits of his theory.”

I looked at things and there was a unified theory before Einstein came along and Einstein was working from it: Boscovich theory. [7] It does predict more than Einstein, bearing in mind modelling etc. A lot of mistakes have been made with Einstein's theorising. But its not really in Koberlein's way of thinking about things that way, and he misrepresents how theories come about; he's too indoctrinated with his way. There are too many like him indoctrinated into getting things round the wrong way.

References

[1] <https://lifeboat.com/ex/bios.brian.koberlein>

[2] <https://www.universetoday.com/108044/why-einstein-will-never-be-wrong/> Posted on January 13, 2014 by Brian Koberlein

[3] <http://www.naturalphilosophy.org/site/critical-thinking/>

[4] Modeling reality with mathematics- Syed Shahzad Raza

<https://habib.edu.pk/sseblog/2015/10/15/modeling-reality-with-mathematics-shehzad-raza/>

[5] The WE-Heraeus International Winter School on Gravity and Light, Lecture 9: Newtonian spacetime is curved! (International Winter School on Gravity and Light 2015)

<https://www.youtube.com/watch?v=IBICu1zgD4Y>

[6] For example of what is said about cosmological constant see: Einstein's 'Biggest Blunder' Turns Out to Be Right, by Clara Moskowitz November 24, 2010 <https://www.space.com/9593-einstein-biggest-blunder-turns.html>

[7] <https://www.youtube.com/watch?v=w1vi0yk7BvU>

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