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Dissident at Oxford Relativity course 2:

Open debate on Einstein's relativity between critics and supporters is required

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1. Introduction

This is the second article submitted for the course I attended at Oxford University for Einstein's relativity, where I introduced myself to the other students by telling them I was convinced Einstein was wrong.

I proposed several articles attacking Einstein, which the tutor did not want to accept; however he did allow an article calling for there to be an open debate between Newtonians and Einsteinians. From my point-of-view – Newtonian physics was unfairly treated in 1919, and there should have been no Einstein revolution but debate since then and since has been squashed.

Here is the article:

2. Open debate on Einstein's relativity between critics and supporters is required

There should be an open debate on Einstein's relativity - whether it is really justified, because it did not happen circa

1919 in the commotion of Einstein becoming famous. The Royal Society accepted that the prediction of Einstein for the bending of light was observed by Eddington's astronomical observations. However, there was never a real debate as to whether it was justified as meaning that Newtonian physics should be replaced by Einstein's relativity, because there was not enough evidence 'then' to make such an assessment. Now these many decades later there is enough information to be able to assess more precisely what is the connection between Newtonian and Einsteinian physics.

McCausland [1] recounts that Sir Joseph Thomson - the President of the Royal Society and the chair at the meeting that endorsed the Einstein's prediction for starlight bending as being confirmed, had done so before critics of Einstein were allowed to speak.

McCausland points out that Pais had given the wrong impression that criticisms from the main critic Silberstein had been heard before the results were endorsed. He says: "Pais's account gives the impression that Silberstein's criticisms had been heard before the results were endorsed by the President of the Royal Society. However, the generally accepted account of the meeting (Thomson 1919) shows that Thomson had to use Pais's words 'pronounced the canonization' before Silberstein had a chance to speak." (By 'canonization' meaning endorsement of Einstein's prediction.)

McCausland also points out that the Royal Society had not enough people aware at the time about the issues of relativity to be able to make informed and valued judgments of whether Newtonian physics needed to be replaced by this experimental observation. It was only one observation and more observations needed to be made to confirm the result. Basing the overturning of Newtonian physics on what turned out to be a very dubious result is as McCausland puts it destroying the objectivity of science.

These many decades later - we have now gathered enough evidence to contrast Newtonian physics with Einsteinian physics in an open debate - a situation that was not possible in circa 1919; such a debate is long overdue.

There are examples in the scientific literature that Newtonian physics can give the same results as Einsteinian physics. For instance one by Silberstein [2] , who was the main critic of Einstein at Thomson's Royal Society meeting and one by Houston [3].

Silberstein's 1923 article reports: "We thus see that, in the rest-system of the free particle, the general relativistic equations (1) become identical with the Newtonian equations of motion, rigorously, i.e. whether the gravitation field is weak or not."

Houstoun reports on being able to get the same results as Einstein from Newtonian physics on two issues: "As is well known, Einstein's theory of gravitation predicts three small effects not previously known. Two of these are the deflexion of light rays passing near the sun and the advance of Mercury's perihelion. I have found that these are given very simply by Fermat's principle and the principle of least action respectively."

None of this surprises me, because I am well aware of mathematical modelling; if a theory makes certain predictions and something extra happens to what is predicted then an extra effect is usually credited as the cause. For instance if a theory predicts objects fall by gravity and hundreds of observations reveal this to be the case and then one day the object goes up instead of down, the deviation from theory is usually credited to some extra effect such as wind. Observations different from what has been a successful theory usually result in some extra effect being added to the theory. So if Newtonian physics could not explain certain observations that Einsteinian physics could explain, it would generally mean an extra effect needed to be added. However, from these critics it seems that Newtonian physics as it 'is' without update might be able to explain same results as Einstein predicted.

That appears to be forgotten by the mainstream, lost in the masses of paperwork that becomes the history they forget about. It was not possible to properly assess Einsteinian physics in 1919 circa, it was something that the Physics Department needed to get back to at a later date, but they let it become history that they forgot. In other words the Physics Department does not talk to the History of Physics Department, and forgets to perform important tasks like an absent minded husband needing to be reminded by his wife.

Einstein never got a Nobel prize for relativity, instead he got the prize for contributions to physics especially the photoelectric effect, it was because of this issue of doubt - whether his physics genuinely replaced Newtonian physics.

As McCausland points out - because general relativity was supposedly proven, this led to special relativity being adopted.

However, special relativity makes no sense from a Newtonian physics perspective. Geroch [4] points out the constancy of light speed makes no sense from Newtonian physics and uses this as justification for changing to special relativity. Burke [5] seems to be saying similar. Newtonian physics is based on universal time, while special relativity abandons that in favour of light speed constancy.

[Tutor did not like the use of the term “universal time” he wanted it to be called “absolute time”, because he thought it might be confused with another sense in which the term is used in Einstein's relativity. From my perspective – this is one of the problems with Einstein's theorising he wants to change meaning of terms. I think its clear in the context of Newtonian physics that the term “universal time” is to mean that observers have same rate for their clocks.]

Burke says: “To someone steeped in the physics and philosophy of Newtonian mechanics, time is a more basic idea than light, and to choose any but a time-specialized frame would seem bizarre.” (By ‘time-specialized’ frame - I take it to mean a Newtonian frame based on universal time.) He goes on to say : “The revolutionary idea of special relativity is that

light is more basic than time." This all ties back to the missing debate on Einstein at the Royal Society; about whether such a revolutionary change was necessary.

Objectivity had been lost because of there being no debate. There needs establishment of a clever unambiguous account of what is the real status of experimental observations with regard to Newtonian and Einsteinian physics; something that can only come about by open debate on these issues.

[Tutor's comment: "A good clear account of your viewpoint with well quoted sources of evidence and a clear conclusion. Well done." Though in talking with the tutor he presented his viewpoint that science/physics was in continual open debate; that whenever experimental results were gathered it became a debate as to what theory the data agreed with. I think he missed the point of the article – namely that Einsteinian physics had never been agreed upon as replacing Newtonian physics by any debate. But the delusion is still being propagated that it had.]

References

[1] Anomalies in the History of Relativity, Ian McCausland, Journal of Scientific Exploration vol.13 no.2, 1999 p 271-290

[2] The True Relation of Einstein's to Newton's Equations of Motion, Ludwik Silberstein, Nature Dec 1, 1923, p 788 - 789

[3] A Relativity Query, R A Houstoun, Nature July 4, 194,p 25

[4] General Relativity from A to , Robert Geroch, The University of Chicago Press, ISBN 0-226-28864-1 p 58

[5] Spacetime, Geometry, Cosmology, William L Burke, University of California 1980, ISBN 0-935702-01-6 p 29

Articles [2] and [3] attached.

The True Relation of Einstein's to Newton's Equations of Motion.

THE equations of a space-time geodesic or Einstein's general equations of motion of a free particle are, in usual symbols,

$$\frac{d^2x_\iota}{ds^2} + \left\{ {\alpha\beta \atop \iota} \right\} \frac{dx^\alpha}{ds} \frac{dx_\beta}{ds} = 0, \quad \iota = 1, 2, 3, 4. \qquad (1)$$

In order to show their relation to Newton's equations of motion, which may be written

$$\frac{d^2\xi_i}{dt^2} = \frac{\partial\Omega}{\partial\xi_i}, \quad i = 1, 2, 3, \qquad (N)$$

Einstein considers the special case of slow motion in a weak gravitation field, *i.e.* such that the metrical tensor components $g_{\iota\kappa}$ differ but little from their Galileian values. Then, neglecting squares, etc., of these small differences and also their derivatives with respect to x_4 (quasi-stationary field), Einstein easily obtains the Newtonian equations as a first approximation, with $\Omega = -\frac{1}{2}c^2 g_{44}$ as the classical potential of the gravitation field. This treatment of the question is repeated, so far as I know, by all exponents of Einstein's theory.

Now, as has recently occurred to me, the true relation of Einstein's equations to those of Newton is of a much more intimate nature, and remains valid, no matter how strong the field and how much space deviates from Euclidean behaviour.

In fact, the frame most natural to adopt for an interpretation of the complicated equations of motion (1) of a particle being clearly its own *rest-system*, let x_1, x_2, x_3 be the space-coordinates of the particle in such a system (the latter, of course, to play its part during an infinitesimal time and to be replaced successively by others and others). Moreover, let for convenience the origin of x_1, etc., be taken at the particle itself. Then, at any instant, $x_\iota = dx_\iota/ds = 0 \, (\iota = 1, 2, 3)$, and equations (1) will reduce to $ds^2 = g_{44} dx_4^2$ and the three equations

$$\frac{d}{dt}\left(\frac{1}{\sqrt{g_{44}}} \frac{dx_i}{dt}\right) = -\frac{c^2}{\sqrt{g_{44}}} \left\{ {44 \atop i} \right\}, \qquad (2)$$

where $dt = dx_4/c$, the fourth equation being already utilised. Now, with i, k reserved for 1, 2, 3,

$$\left\{ {44 \atop i} \right\} = g^{ik}\left(\frac{\partial g_{4k}}{\partial x_4} - \frac{1}{2}\frac{\partial g_{44}}{\partial x_k}\right) + \frac{1}{2}g^{i4}\frac{\partial g_{44}}{\partial x_4}.$$

The coordinates can always be chosen so as to make $g^{41}=g^{42}=g^{43}=0$. This means a frame not spinning relatively to the stars. In these coordinates then, or in such a rest-platform of the particle,

$$\left\{ {44 \atop i} \right\} = -\tfrac{1}{2} g^{ik} \frac{\partial g_{44}}{\partial x_k},$$

and since the x_i can now always be measured along the principal axes of the operator or matrix g^{ik} (when also $g^{ii}=1/g_{ii}$), we have

$$\left\{ {44 \atop i} \right\} = -\frac{1}{2g_{ii}} \cdot \frac{\partial g_{44}}{\partial x_i},$$

no more to be summed over i, of course. These values substituted in (2) give, with $g_{ii}=-a_{ii}$, and since $\dot{x}_i = dx_i/dt = 0$,

$$\frac{d^2(\sqrt{a_{ii}}x_i)}{dt^2} = -\frac{c^2}{2} \frac{\partial g_{44}}{\sqrt{a_{ii}}\partial x_i}. \quad . \quad . \quad (3)$$

Now, the space-line element of our platform being

$$dl^2 = a_{11}dx_1^2 + a_{22}dx_2^2 + a_{33}dx_3^2,$$

$\sqrt{a_{11}}dx_1$, etc., are the length elements $d\xi_1$, etc., measured along the axes precisely as in (N), and the right-hand member of (3) expresses the gradient of $\Omega = -\frac{1}{2}c^2 g_{44} +$ const. With a proper choice of the constant, $g_{44} = 1 - 2\Omega/c^2$.

We thus see that, *in the rest-system of the free particle, the general relativistic equations* (1) *become identical with the Newtonian equations of motion, rigorously, i.e.* whether the gravitation field is weak or not ($2\Omega/c^2$ a small fraction of unity or not), and no matter how strongly the platform-space differs from a homaloidal or Euclidean space.

This simple investigation is here given not merely because it seems to put the general equations (1) into an interesting and familiar light, but also because it vindicates the rights of the Newtonian equations of motion.

Ludwik Silberstein.

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A Relativity Query

As is well known, Einstein's theory of gravitation predicts three small effects not previously known. Two of these are the deflexion of light rays passing near the sun and the advance of Mercury's perihelion. I have found that these are given very simply by Fermat's principle and the principle of least action respectively.

The matter can be put shortly, as follows:

$$\delta \int \sqrt{1 + \left(r \frac{d\theta}{dr}\right)^2}\, dr = 0, \quad . \quad . \quad (1)$$

an application of Fermat's principle, gives the straight line; r and θ are two-dimensional polar co-ordinates.

$$\delta \int \sqrt{\frac{2\,km}{r} - C}\, \sqrt{1 + \left(r \frac{d\theta}{dr}\right)^2}\, dr = 0, \quad (2)$$

an application of least action, gives the ellipse. Now repeat the two equations but suppose that the medium is very slightly ælotropic, writing

$$\sqrt{n_r^2 + \left(n_\theta\, r \frac{d\theta}{dr}\right)^2}\, dr$$

for the element of optical length where

$$n_r = n_\theta^2 = \left(1 - \frac{2km}{rc^2}\right)^{-1}$$

and c is the velocity of light. The application of Fermat's principle then becomes

$$\delta \int \sqrt{n_r^2 + \left(n_\theta\, r \frac{d\theta}{dr}\right)^2}\, dr = 0; \quad . \quad . \quad (3)$$

and the application of least action

$$\delta \int \sqrt{\frac{2km}{r} - C}\, \sqrt{n_r^2 + \left(n_\theta\, r \frac{d\theta}{dr}\right)^2}\, dr = 0 \quad (4)$$

The two equations give respectively *exactly* the same paths as Einstein obtains for the passage of the light ray and the planet in the sun's gravitational field. The results come out very easily. It is the slight ælotropy of the medium that constitutes the difference between Newton and Einstein. The first three equations can be obtained from the final one by omitting the appropriate terms.

Now these seem to be important results, and there is a strong probability that they have appeared in print before, but I have not been able myself to find a reference to this having happened, neither have authorities whom I have consulted. Can any reader of NATURE give me information?

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