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Dissident at Oxford Relativity course 3:

Space, Time and the Universe

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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.

The first lecture was on: "Space, Time and the Universe," was was a general background on the history leading up to Einstein's theories. I will only give a few highlights:

It started from Greek geometry, especially Euclid's five postulates:

Postulate 1: Given any two points, there is a unique straight line that joins them.

Postulate 2: Any finite straight line may be continued in a straight line.

Postulate 3: Any point may be the centre of a circle, which may have any radius.

Postulate 4: All right angles are the same.

Postulate 5: which can be stated in various ways is the parallel postulate.

It was pointed out that the first four of Euclid's postulates deal with the basic ideas such as points and lines and really asserting that space is the same everywhere (HOMOGENEOUS), the same in all directions (ISOTROPIC), without limit (UNBOUNDED) and without gaps (CONTINUOUS). Whereas the fifth postulate seemed like it might be deduced from the other four, and so a lot of effort was expended in trying to do that.

An attempt to prove Euclid's fifth postulate was to try the method of REDUCTIO AD ABSURDUM- such a method was to assume the fifth postulate was wrong and then deduce a self-contradictory consequence. However, although assuming Euclid's fifth postulate was wrong did not give Euclidean geometry, it did not give self-contradiction. This led to the idea of self-consistent non-Euclidean geometry (or geometries) based on postulates different to Euclid's.

There was a digression to Descartes and Cartesian coordinates.

I am assume the reader of this article knows all of this; if not then there are various texts in existence dealing with this level of geometry. It's only when we get to Einstein that things start to go wrong.

The tutor did introduce into this so-far historical account what he interpreted Einstein's derivation of Lorentz transformation to mean. He did admit that Einstein's derivation was not the best derivation though. I won't deal with that in this article, because it was out of context; really he was dealing with the history of geometry up to Einstein.

So, the tutor dealt with analytic geometry, coordinates and coordinate transformations. Then he got to Gauss (1777-1855) who was one of the first to recognise the possibility of non-Euclidean geometry.

According to tutor: “An important step was the realization that when the coordinate separations dx, dy or dr, $d\theta$ are very small, LINE ELEMENTS such as $(dl)^2 = (dx)^2 + (dy)^2$ and $(dl)^2 = (dr)^2 + (d\theta)^2$ are not just consequences of Euclidean geometry but actually provide a basis for developing the whole of Euclidean geometry."

Then it was a talk about differential geometry. He was talking about the 2 dimensional case and gave:

$$(dl)^2 = g_{11} (dx_1)^2 + g_{12} (dx_1 \; dx_2) + g_{21} (dx_2 \; dx_1) + g_{22} (dx_2)^2$$

g_{11} , g_{12} , g_{21} , g_{22} are called the METRIC COEFFICIENTS and are generally functions of (i.e. may depend upon) x_1 and x_2. The metric coefficients tell us how to relate coordinate differences to distances.

This equation is a special case of:

$$(dl)^2 = (dx)^2 + (dy)^2$$

when $x_1 = x$ and $x_2 = y$
together with $g_{11} = 1$, $g_{12} = g_{21} = 0$, $g_{22} = 1$.

I am rushing through this; all of this is the math that builds up to be used by Einstein's physics; all of it used to confuse the gullible and make them accept nonsense. If you want more details then you need to consort the relevant books, and the tutor was not going into too much mathematical detail anyway; he was just giving an overview.

Tutor: "Gauss obtained a mathematical expression for the curvature K in terms of the metric coefficients and their rate of change. Remarkably, he found K was an intrinsic property of the surface, independent of how the surface was embedded in 3-D space. He called this result the Theorema Egregium (the great theorem)."

So we have zero curvature which would be a flat piece of paper; a positive curvature which would be a spherical surface or negative curvature which would be a hyperbolic surface.

Hyperbolic geometry was developed by Janos Boylai (1802-60) and Nikolai Lobachevski (1792-1856) where Euclid's first four postulates are true but not the fifth postulate. In this geometry – through any point there are infinitely many straight lines that are parallel to a given straight line (I.e they never meet it); such lines just diverge apart.

Elliptic geometry came from Felix Klein (1849-1925), again first four postulates are true but not the fifth. Through any point there are no straight lines that are parallel to a given straight line; such lines just converge.

Riemannian geometry was a generalisation allowing these three types of geometry. For the 2-D:

$$(dl)^2 = g_{11}\,(dx_1)^2 + g_{12}\,(dx_1\ dx_2) + g_{21}\,(dx_2\ dx_1) + g_{22}\,(dx_2)^2$$

Euclidean when: $g_{11} = g_{22} = 1,\quad g_{12} = g_{21} = 0$

Elliptic when: $g_{11} = 1,\ g_{22} = \sin^2 x_1\ ,\ g_{12} = g_{21} = 0$

Hyperbolic when: $g_{11} = 1,\ g_{22} = \sinh^2 x_1\ ,\ g_{12} = g_{21} = 0$

Riemannian geometry can be extended to any number of dimensions, and Einstein's physics uses it as 4 dimensions.

According to tutor: "Until the time of Gauss it was not doubted that the 'true' geometry of space was Euclidean. However, Gauss and his successors realized that since there are many mathematically self consistent geometries, the question 'What is the true geometry of space?' is a question of experimental physics, not mathematics."

I voiced my protest. What is meant by the mathematics is that all three types of geometry – Euclidean, elliptic and hyperbolic are mathematically consistent (and also their generalisation to Riemanninan geometry is mathematically consistent). But to say it is possible to determine the 'true' geometry of the universe by experiment – I consider a delusion.

If two lines that are thought to be parallel do not stay parallel, and if a person believes in Euclidean geometry then he will blame it on there being a mistake with trying to draw them parallel so that they were not perfectly parallel or blame it on an excuse of some force(s) at operation.

If a person believes in non-Euclidean geometry and constructs two lines that appear parallel to the best of his experimental ability to check, then he will blame it on the lines ceasing to be parallel beyond his experimental ability to check.

In this way, a person can use either Euclidean geometry or non-Euclidean geometry to describe the universe. Nothing is determined by experiment; interpretation of experiment is subjective.

When I protested this error in the tutor's lecture; the tutor skipped the issue claiming it defeatist.

There is a great need in scientists to believe that they can determine things by experiment. So, for this issue of 'what is the geometry of the universe' they want to believe that experiment can tell them a definite answer one way or the other. It is the philosophic point-of-view in how they want to interpret physical reality; and is their most fundamental error in thinking; because as explained in my previous articles – Newtonian physics still works!

Such faulty philosophers find it impossible to appreciate that in 1919 – Newtonian physics was not disproved. Rather than accept the subjectiveness, such people have built mainstream physics/science on their mistaken beliefs. We get to Einstein in this history of math and science, and this fundamental mistake is then introduced into their thinking.