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The Einstein Field Equations
Part 1

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First posted December 25, 2012

Before we start, let me confirm once again that I am not an anti-Relativist. I am not here to jettison Relativity. I am here only to correct it (or, as one of my readers recently put it, to *debug* it). Although I have shown that the equations of SR and GR are compromised—and will show it again here—I have also shown they can be corrected. Once I finish my critique of the General Theory here, I will show how time differentials can be added to the gravitational field in a much more simple and direct way, with no need to hide behind the tensor calculus. [In fact, I have shown it in many previous papers, including this one.]

I have recently begun to pull apart the Friedmann metric, having already shown multiple problems with the general metric beneath it. Some will have understood that I have already destroyed all the current equations from their foundations, but for those who don't yet see this, I will continue. To do that requires me to analyze closely Einstein's original derivation of the field equations. I have already done a bit of that in previous papers, but here I will do a good deal more.

I will go all the way back to the first equations once again. From the 1916 paper on the General Theory*, we find this equation leading off the proof:

$ds^2 = -dX_1^2 - dX_2^2 - dX_3^2 + dX_4^2$

where X_4 is said to be the time component. That equation is now often written

$ds^2 = -dx^2 - dy^2 - dz^2 + c^2dt^2$

Both come from notation Einstein borrowed from Minkowski, as we have seen previously. But does either equation make any sense?

Without the time term, both are straightforward. They are just 3D Pythagorean theorem equations, with ds as the hypotenuse. But the time term destroys both equations. To see this, we can simplify the equation. Let us work in one dimension, instead of 4. Let us start with just a line in x, and then we will add in time and see what happens.

Following the sloppy terminology of the tensor calculus, Einstein calls these X's coordinates, but they aren't coordinates, they are lengths or distances from some origin. We see that just from his shrinking of them into infinitesimals, using the d notation. You can't shrink coordinates, since coordinates are points. You can't shrink a point. You can only shrink a distance. We can also tell that from the form of the equation, which, as I said, is an expansion of the Pythagorean theorem into more than two dimensions. The Pythagorean theorem works on lengths, not points or coordinates. We can also tell it from the squares. You can square distances but you can't square points. What is a point squared? Therefore, all variables or infinitesimals in these equations are *already* lengths.

Einstein admits that when he says,

The magnitude of the linear element pertaining to points of the four-dimensional continuum in infinite proximity, we call *ds*.

There it is. He just defined *ds* as a linear element. In the 1916 paper and 1920 edition, he calls it the "line-element." Either way, the assignment is clear: *ds* is a line, not a point. Therefore, by simple logic, the dX's are also lines. Since lines have extension, my point is proved.

Just to be clear, you cannot sum points or coordinates into lines by the Pythagorean method—which is what the squares indicate. If the sum ds is a line, the other infinitesimals must be lines as well. We will see why this is so important below.

So, let us return to our one-dimensional analysis. Let us say we have a length or distance in x. We are then given a time t, which we will say was our time to travel that distance x. Say that x=3 and t=2. Can we add t to x to find a new "metric" separation of 5? Even more to the point, can we *subtract* t from x, finding a new metric separation of 1? Not normally. But say we are abnormal, like Minkowski or Hilbert. Can we find some way to do it then? Well, we might say that we are five length/time units from zero. But to put them in the same equation like that, we would have to imply that whatever units of length we were using were equivalent to the units of time. If we are using meters for length and seconds for time, we can say we have five units of length/time only if we let the meter equal the second. Otherwise the equation is false. Since we can't assume or imply that a meter equals a second, the first equation is false. This also applies to subtraction. You can't subtract seconds from meters in a metric.

I will be told that isn't where the equation above came from. I will be told it isn't a 4D Pythagorean equation. Rather, it comes from the same place the general metric came from, the general metric being

$$-c^2d\tau^2 = -c^2dt^2 + a(t)^2d\Sigma^2$$

Since $d\Sigma^2 = dx^2 + dy^2 + dz^2$, we get

$$c^2d\tau^2 = -c^2dt^2 + a(t)^2[dx^2 + dy^2 + dz^2]$$

Since Friedmann inserted the scale factor a(t) for his own purposes, we can back up a step, removing it to get this

$$c^2d\tau^2 = -c^2dt^2 + dx^2 + dy^2 + dz^2$$

If we let $cd\tau = ds'$, we are back to this

$$ds'^2 = -c^2dt^2 + dx^2 + dy^2 + dz^2$$

That, I will be told, is where the equations come from. The metric only mimics a 4D Pythagorean theorem.

Problem with that is that I have already shown how the general metric is compromised. To show it again, let us go back to this equation

$c^2d\tau^2 = -c^2dt^2 + dx^2 + dy^2 + dz^2$

We can simplify that back to

$c^2d\tau^2 = -c^2dt^2 + d\Sigma^2$

Since tau is a variant form for t', it could also be written as

$c^2dt'^2 = -c^2dt^2 + d\Sigma^2$

But I have shown that equation is false, since it is derived from these three equations

$x' = x – vt$
$x = ct$
$x' = ct'$

By simple substitution, we get

$ct' = ct – vt$

Squaring both sides and using infinitesimals gives us

$c^2dt'^2 = c^2dt^2 – (2cvdt^2 – v^2dt^2)$

Already you can see that Minkowski's metric and the general (or generic) metric beneath the Friedmann equations both came from the first three equations in Einstein's proof of Special Relativity. That is not surprising, since of course Minkowski developed his metric out of the equations of Einstein and Lorentz. Minkowski wrote SR into 4-vector, then Einstein borrowed the notation back from him to begin his GR proof, as we have seen. Friedmann than borrowed the metric from Einstein.

But since the equations x = ct and x' = ct' are false, everything after them is compromised. Both of them contradict Einstein's second postulate on the constancy of light. You can't give light itself a t or a t'; or if you do, t=t'. That is what the second postulate means. The equation x' = x – vt is also false, as I have shown exhaustively in a score of papers.

For this reason, I know going in that any metric that includes the term ct or c^2dt^2 is compromised. The metric $ds^2 = c^2dt^2 - dx^2 - dy^2 - dz^2$ is false because the proof is based on false axioms. Light doesn't travel that way. Einstein's first three equations in his proof baldly contradict his second postulate. This failure of the proof destroys the general metric, it destroys the SR proof, it destroys Minkowski's metric, and through Minkowski, it destroys the GR proof. I am not an anti-Relativist, so I don't mean to imply GR can't be saved. But it has to be rewritten from the ground up.

For more proof of my claims above, we can return to Special Relativity. Einstein bases the proof of General Relativity on Special Relativity, as is known. He says, subsection 4, paragraph 2:

For infinitely small four-dimensional regions the theory of relativity in the restricted sense is appropriate, if the co-ordinates are suitably chosen.

Relativity "in the restricted sense" is Special Relativity. So he is explicitly importing equations here straight from SR. As I have pointed out before, Einstein uses a variant equation in the appendix to the book *Relativity*, as a proof of *Special* Relativity. Equation 10 is

$$r = ct = \sqrt{(x^2 + y^2 + z^2)}$$

I would say it is pretty obvious that comes from the Pythagorean theorem. I also pause to draw your attention to the fact that it is *light* that is traveling here in the metric, and not anything else. Light is traveling along a diagonal r. Einstein then squares both sides and sets it to zero.

$$x^2 + y^2 + z^2 - c^2t^2 = 0$$

Same equation he starts GR with, except for two things. In GR he multiplies through by -1, for reasons that never become clear. And in GR, it is not light moving along r. In GR, he switches from r to s, and then lets *nothing* move along s. He starts with a system of coordinates, not a *motion* in a system of coordinates. We see why this is if we study the equation more closely.

$$ds^2 = -dX_1^2 - dX_2^2 - dX_3^2 + dX_4^2$$

The last term there is the time term, so it is the analogue to the c^2t^2 term. If those five terms stand for points, the equation makes no sense, as I said. You can't square points and you can't use the Pythagorean theorem on points. Only on distances. So something must be traveling along those distances. In the proofs of Special Relativity Einstein lets light move along r. What is moving along s here? Nothing. Why? Because Einstein *can't* assign anything a motion along s. Why? Because the distance s is 0. Since it is the same equation as the other equation, ds^2 *must* equal 0.

Look at the equations again. All we do is multiply through by -1. Then if we *don't* go to a very small area, instead staying at the normal level; and if we let $X_4^2 = c^2t^2$, then we get

$$s^2 = x^2 + y^2 + z^2 - c^2t^2 = 0$$

Now, isn't that an eye-opener? The variable s isn't really replacing r at the limit. No, r was equal to ct, remember? So r is becoming the time term. **The variable s is replacing the number 0**. But how can the 4-vector field equal zero? You will say that Minkowski lets this equation equal 1, not 0, so my question is extended: how can the 4-vector field equal either 1 or 0? This is in the form of a 4-D Pythagorean theorem, so s should equal some diagonal that some object is traveling. Doesn't have to be light: Einstein could assign that motion along s to anything. But he can't assign it to nothing, and the distance traveled cannot be zero. I would have thought that didn't need to be said. If you have a 4-vector field where the distance traveled by a proposed object is 0, the field disappears. *There is no field at zero.*

It also cannot be equal to 1, because although that may make the 4-vector symmetrical, it it breaks all the other rules of math. You can't set a 4D Pythagorean theorem equal to 1, because s would have to be equal to 1, and s is *already defined* as the hypotenuse of a 4D "triangle." It is already defined as a line-element, and *as a variable*. If s is equal to 1, this completely restricts your solutions, since s is then a *constant*. You can't take a constant to a limit! Can you take the number 1 to a limit? NO. All your field calculations and solutions are then for a particle that is moving a distance of 1. That isn't what either Einstein or Minkowski intends. Both have been criminally sloppy in moving this equation from SR to GR.

Again, what has happened is that r was the distance light was traveling in the metric. Einstein then let r = ct. So that is how the time variable got into the equation. That is the time t for light to travel distance r in the metric x,y,z. It is not a 4^{th} vector, it is the time assigned to light c. But following Minkowski's slop, Einstein allowed this term to be moved over with x,y,z, and to be re-assigned to a 4^{th} vector in the metric. The empty spot on the left side of the equation—that had been filled by 0—was then *illegally* refilled with another variable (s) made up from nothing. This variable was never assigned to anything, and it has still never been assigned to anything. It should be some diagonal, but Minkowski set s equal to 1 in order to perform some "mysticism" of his own. And Einstein then borrowed the equation back and used it as the coordinate system itself. As if you can use the Pythagorean theorem as the basic coordinate system of a metric.

In this way, you can actually see that Einstein has taken the Pythagorean theorem to a limit—while it was equal to 0 or 1—and then imported it into a 4X4 matrix. By this method, he could manufacture any matrix he liked. All you have to do is move the s variable to the right side, manufacture another variable from nothing, and claim you have invented a new dimension. The fact that you did it then stands as proof it can be done. You may or may not be surprised to hear this is exactly what string theory has done. This is their basic method, by which they have manufactured 11 dimensions and counting. But since the 4-vector was originally set to zero—by definition and all the rules of math—any higher order vector space must also equal zero. Meaning, not only is s=0, but all new manufactured "dimensions" are also necessarily equal to zero.

To see this from still another angle, let us go to section XXVI of the book *Relativity* (p. 92, 15^{th} ed. 1952). There we get some backstory on this ds^2 variable. Einstein defines two coordinate systems from the beginning, instead of one: the primed and unprimed systems. He then offers the equation

$$dx^2 + dy^2 + dz^2 - c^2dt^2 = dx'^2 + dy'^2 + dz'^2 - c^2dt'^2$$

Looks good at a glance, but does it make any sense? Once again, no. The two 4-vectors can't be equal, because if they are, we have no Special Relativity, no time differentials, and no possible transforms. Since Einstein defines ds as

$$ds^2 = dx^2 + dy^2 + dz^2 - c^2dt^2$$

the first equation would indicate that $ds^2 = ds'^2$. But if $ds^2 = ds'^2$, then not only is there no time separation, there is no separation at all. The systems are not only equal, they are equivalent. There aren't two systems, there is *one* system, and therefore no need for the prime.

This means the first equation is false. The second equation is also false, since ds^2 is manufactured from nothing, literally. On page 119 of the same book, Einstein gives us this equation

$$0 = x^2 + y^2 + z^2 - c^2t^2$$

So s^2 is equal to zero. Shrinking this whole 4-vector down to an infinitely small size won't change that. You can't take zero down to an infinitely small size, and even if you did, it wouldn't suddenly become a variable or an infinitesimal. Zero is constant, remember?

Einstein even admits that. Equation 11 on page 119 is

$$\sigma(dx^2 + dy^2 + dz^2 - c^2dt^2) = dx'^2 + dy'^2 + dz'^2 - c^2dt'^2$$

Note the sigma! Page 119 contradicts page 94. But equation 11 is still false, even with the sigma, since it would reduce to

$$\sigma(0) = 0$$

That equation is true, I guess, but the transform sigma isn't doing much work. Just watch

$$r = ct = dx^2 + dy^2 + dz^2$$
$$0 = dx^2 + dy^2 + dz^2 - c^2dt^2 \quad \text{(equation 10)}$$
$$r' = ct' = dx'^2 + dy'^2 + dz'^2$$
$$0 = dx'^2 + dy'^2 + dz'^2 - c^2dt'^2 \quad \text{(equation 10a)}$$
$$\sigma(dx^2 + dy^2 + dz^2 - c^2dt^2) = dx'^2 + dy'^2 + dz'^2 - c^2dt'^2 \quad \text{(equation 11)}$$
$$\sigma(0) = 0$$

As I have shown elsewhere, this is precisely how Minkowski was able to “confirm” Einstein's transform *gamma* “through a simple manipulation.” Minkowski set the given metric equal to 1 instead of 0, using this as a shortcut to *gamma*. However, Minkowski borrowed his initial metric from Einstein and Lorentz, as we know. Since Minkowski started from the same first equation, his clever manipulation took him to the same *gamma* that Lorentz and Einstein had found earlier. But, since that first equation was wrong, Minkowski's 4-vector is also wrong. In other words, Minkowski's proof is fine, as it stands. The derivation *after* the postulate equations are true. But since the postulate equations are all false, the proof falls anyway. An airtight proof based on a false set of postulate equations is still false.

Going back to my previous analysis, we can see why this is in more detail. Once Minkowski wrote the metric in 4-vector that way, someone should have thought to analyze it as a piece of kinematics. As I have already begun to show, it makes no sense as either math or physics, no matter what proof it came from. I have shown that Einstein's first equation in GR above makes no sense, because whether or not it was purposely written as a 4D Pythagorean theorem, it now *is* one. Why should the first three terms make sense as Pythagorean theorem vectors, but the fourth doesn't? If the time term looks and acts like a Pythagorean theorem vector, why isn't it? It is like saying that Donald looks like a duck and quacks like a duck, but he isn't a duck simply because I don't *intend* for him to be a duck.

The second form of the equation is even more compromised and nonsensical.

$ds^2 = -dx^2 – dy^2 – dz^2 + c^2dt^2$

Here we have the Pythagorean summation of four vectors, written as infinitesimals, as you see. The 4th and last vector is called the time vector, but it is really a length vector. Since c is a velocity, ct is like vt, and it reduces to x. So the fourth term is just another distance. They try to hide this with the squares and the d, but that is how it is. Again, x = ct. That is where that term comes from.

But remember that Einstein is trying to shrink down his vectors X into infinitesimals at the beginning of his GR proof of 1916. The Minkowski metric is also doing this, of course, since he too uses the d notation. That is a limit or infinitesimal notation, so we are in a very small space here. But then we have c^2 in there as well. That is odd, because c^2 is very large, being about 90 million billion m/s. If our time scale in the equation were 1s, then our space would not be infinitesimal, it would be about 1/10th the size of our galaxy. What this means is that if we shrunk our x,y,z space down to the size of the proton, we would have to shrink our time t down to 10^{-22}s in order to match it. Having c^2 in an equation makes it difficult to shrink down, since c^2 is not a variable. It can't be shrunk.

I will be told that the c^2 is transforming our seconds into meters, just as I stated it above. I said that if we were going to put meters and seconds in the same equation, we would have to show they were equal. Well, that is what Minkowski is doing. He is transforming seconds into meters, by multiplying the time term by c^2. However, all that is a pretty meaningless game, because time can't be added (or subtracted) into the metric regardless. It conflicts with the definitions of motion and velocity and acceleration.

That is, we *can* use c as a time/distance transform, and I have done it in other places to create real solutions. The equation x = ct *can* be used as a transform between meters and seconds, but it *can't* be used as Einstein and Lorentz used it. As I have shown again and again, Einstein used x = ct in conjunction with x' = ct', calling them light equations. This was supposed to be an expression of how light moved in S and S'. They *cannot* be used in conjunction like that, with those coordinate assignments, because that contradicts postulate 2. If light moves differently in S and S', then the constancy of light is immediately overturned. Those equations, *in conjunction*, are false. Taken separately, as time to length transforms, they are true.

And, although x = ct is true as a transform, we can't use it here to create a meaningful 4-vector metric. The definition of velocity prevents it. To create this sort of 4-vector, we would have to redefine velocity and acceleration, and we haven't done that. Remember, velocity is defined as x/t, so t is not *operationally* equivalent to the other three vectors. To start with, while the other three go in the numerator, time goes in the denominator. That fact by itself is crucial. Time does not exist *in addition* to x, y and z in the metric. It exists simultaneously with x, y and z, but only as a standard. In the equations of motion (kinematics), time is always a pre-existing standard. It exists only as a comparison, so that we can *measure* x, y, z, or all three against it. It is a second measurement of either x, y or z, which is then used to create a ratio, in the form x/t. It is a sort of manufactured subfield, by which we measure the field. It is a *sub*field, and it *goes under* x, y or z in a velocity equation. V = x/t. It doesn't go *next to* them, since we don't find v = xt or a = xt^2. For the same reason, it can't go next to x,y,z in the 4-vector. It isn't operationally like x,y,z.

In this sense, time is like the standard kilogram. It exists in the same way the standard kilogram exists. Just as we don't add the standard kilogram to all weights, we can't add time to the metric.

Space is not 4-dimensional; space is 3-dimensional, and we use time to compare various motions to one another. In other words, you don't bring time into the metric *until* you start computing velocities. Since Einstein's first equations don't contain any velocities, he doesn't need any time in the metric. As you see, Einstein is writing an equation to calculate a ds.

$ds^2 = -dx^2 - dy^2 - dz^2 + c^2dt^2$

You don't need a velocity or motion or time to calculate a ds. A ds is just a length, which he admits can be measured "with a rigid rod." The operation of measurement with a rigid rod requires no notice of time. You have no need for time or motion in an equation to calculate ds. Only if you were writing an equation for dv would you need to add time to the metric. For this reason, the term c^2dt^2 is both superfluous and false. You can't add time to the metric because time isn't *in* the metric like the other three variables.

You also would have no *need* to measure s with a rigid rod, since it is already *defined* as either 0 or 1.

To prevent you from the analysis I just did, the mainstream now writes the Minkowski metric in a form that starts with three negative terms. They like to start with all the minuses, since that diverts you from noticing the Pythagorean form of the equation. We may assume that Minkowski was the first to use this trick, since he was a master of such tricks. However, it has never been explained how s is a vector opposite to x, y, or z. Why is ds not negative? No one knows or cares, as we see. This is all another unanalyzed mess, believed because it is believed.

Another problem with the basic metric of GR is that with or without the time term, the metric is still based on a ds defined as the hypotenuse of a triangle. That is, ds is split into orthogonal vectors, either three or four, and defined by the Pythagorean theorem. This is a problem because I have shown real bodies don't move like that in the real field. Real bodies follow the limit of the Manhattan metric, not the co-called Euclidean metric (or now Minkowski metric). In other words, we should be summing the orthogonal vectors, not the diagonals or hypotenuses. You will say, "We *are* summing them. That's what the pluses are in the equation $ds^2 = dx^2 + dy^2 + dz^2 - c^2dt^2$." But we shouldn't be summing them by the Pythagorean method, since the Pythagorean method is a geometric method only. As you see, it gives us a ds which is a slant in the field. Real bodies don't move in slants in the field. Whether they are moving in a straight line or a curve, they *never* move on mathematical hypotenuses. We have always assumed that since the arc and chord are the same at the limit, real moving bodies move along chords. But they don't. I have destroyed Newton's proof of the arc and chord. The arc doesn't approach the chord, even at the limit. It doesn't even get close. The arc is longer than the chord, even at the limit. It is the arc and tangent that are connected, not the arc and chord. For this reason, even the 3D expression of the Minkowski metric is false. Even this equation is false:

$ds^2 = dx^2 + dy^2 + dz^2$

Real bodies don't move on ds's. They don't move on chords, slants, diagonals, or hypotenuses.

In the next step, Einstein tries to turn his coordinates into differentials. But since his variables in the first equation were already infinitesimal lengths, they were already differentials. An infinitesimal in the form dX is already a differential, and doesn't need to be turned into one. Every length is already a differential, since it is the *difference* between one end of the length and the other.

This is basic math and logic, and the fact that neither Einstein, Minkowski, nor Hilbert appears to have understood that is frightening. The fact that this has stood for nearly a century, and is still published in the same form, means that both math and physics have been unmoored for a very long time.

In fact, they were unmoored by the tensor calculus, which does this very thing. It begins by assigning a set of values to a point, each value being a coordinate. It then fails to define these values as anything at all. But since these values are in fact *numbers*, the numbers have to apply to something. The tensor calculus mathematicians never define an origin, or even mention one, since they don't like anything to cut into their freedom to move; but without an origin, the numbers are free-floating and meaningless. Say one of your "values" is 5. Well, a point *by itself* can't have a value of 5. If we assign a point or coordinate a value of 5, it can only mean it is five somethings from something. Usually that second something is an origin and the first something is dimension, like seconds or meters. But those who love the tensor calculus don't want to admit that, because that gives them a straightline distance from an origin, and they are avoiding all hard-and-fast things like straight lines. They hate them. They also don't like dimensions, because dimensions imply reality and they also hate reality. Reality is so limiting. So they just work with free-floating "values."

This is precisely where Einstein's shiftiness comes from in this first section. He has agreed to take on the terminology of the tensor calculus, and in doing so has thrown all rigor out the window. Like the princes of the tensor calculus, Einstein is avoiding all definitions and explanations and clarity *on purpose*. It gives him more room to move. This is why he pretends to no longer know the difference between a point and a distance, or between a coordinate and a differential. He wishes for you to think in terms of values only, and to ask no kinematic or mechanical questions about those values. He wishes for you to keep your eyes on the coefficients, because if you do, you will forget to ask anything about the physics.

But let's move on. Because Einstein is simply turning his first equation into a matrix, we can analyze the matrix rather than the lead-up to it. Most of the first page of Einstein's proof is strange, but we can ignore it as frightening but mainly inconsequential. We now get the Minkowski matrix, in the standard 4X4 form, but with three -1's and one +1 on the diagonal (see p. 120). That comes straight out of Einstein's first equation, where we have three negatives and one positive term. But since I have just proved that the 4-vector equation is false, the Minkowski matrix must be false as well. Einstein has postulated no motion or velocity yet, only coordinates or differentials. You can't get a 4-vector or 4X4 matrix from that. The best he could do is a static 3X3.

Also curious is that directly after giving us the matrix, he says that the quantities in the 4X4 "are to be looked upon as magnitudes which describe the gravitation-field." However, just a few paragraphs earlier, he said, "an infinitely small coordinate system is hereby to be chosen, that the gravitational field does not appear." That is why we have dX's instead of X's. We are in a very small space. When did we rise out of that very small space? When did the gravitational field appear, and why? Rigorously, the gravitational field can't appear until Einstein derives the stress-energy tensor—so that we have some forces in the field—but he wants us to believe it already exists, before any forces are postulated, or even any motions. You will see why later.

Also curious is the statement, "ds^2 is a definite magnitude belonging to two point-events infinitely near in space and time and can be got by measurements with rods and clocks."** I don't know of any rods or clocks that can measure infinitely small spaces or times, do you? It looks like Einstein wants it both ways: he wants his coordinates in his first equation to be infinitely small, but he wants those coordinates to suddenly swell when they make the 4X4 metric, magically becoming both definite and gravitational. He has gone to an infinitely small area of space where gravity doesn't pertain, and then mathematically derived a gravitational field out of it, by some waving of a wand.

Only *after* he sets his 4X4 and his gravitation-field does he postulate a motion in the field. He introduces "a free material point moving uniformly in a straight line." He says that this turns his $g_{\sigma\tau}$'s into $g_{\mu\nu}$'s. But does it? No. Again, the $g_{\sigma\tau}$'s won't be turned into $g_{\mu\nu}$'s unless all differentials are in motion, and that can't happen until a large gravitating body is brought in to stress the entire field. At this point we only have one body moving across the field, and if it is "infinitely" small like everything else in this field, its velocity will be completely local. It will affect only the *g's* it crosses and no others. Einstein is still in an SR situation, as he admits, so the motion in the field will be caused by contact, we assume, not by gravity. His moving point would be moving from an initial push, for example, not from a gravitational pull or field curve. If his free material point were affecting all points in the field, the field would already be curved.

And we see another problem with his "free material point." That is a contradiction itself. There can be no material at a point. The word "material" implies extension, and a point has no extension. There is no mass at a point, by definition.

Einstein immediately denies this, however, because he claims that simply introducing a moving point in the field makes the field both gravitational and curvilinear. He switches from calling his point a "free material point" to calling it a "free point-mass." He is performing a bit of sophistry here, by gliding conveniently between terms without ever bothering to either give definitions or stick to them. He is assuming 1) that points can have mass, 2) that point-masses, no matter how small, can cause curves.

This is a problem for several reasons. First, it is a problem because he just said in the previous sentence that his introduced material point moved "uniformly in a straight line." Two sentences later the same point-mass is moving in a fashion that "will appear curvilinear, and not uniform." He did not introduce anything else into the field in between the two statements, or make any other changes or additions to his field or metric. How and why did the straight line suddenly become curved? Second, it is a problem because he is still in a very small space, determined by his infinitesimals. Why does gravitation pertain now, but it didn't pertain before? Einstein is implying that a moving point is enough to curve the field, **but he already had moving points in his Special Relativity proof which *did not* curve the field.** Why do moving points in SR not curve the field or create gravity, but moving points in GR do? Could it be because he *needs* them to create gravity here?

Einstein then says,

We see that the appearance of a gravitation-field is connected with space-time variability of $g_{\sigma\tau}$'s. In the general case, we cannot by any suitable choice of axes make special relativity valid throughout any finite region. We thus deduce the conception that $g_{\sigma\tau}$'s describe the gravitational field.

That is extraordinary, because Einstein is saying that the matrix itself is somehow creating the gravitational field. He has done nothing here that he didn't do in his proof of SR, except translate his

Cartesian-graph arguments into a Minkowski-metric argument. All he has decided to do is use tensors, but *by doing that and by doing nothing else*, he has turned his rectilinear field into a curvilinear field.

This confirms my assertion in previous papers that Einstein's choice of math determines the curvature of the field, *and nothing else*. Simply by choosing a potentially curved math, Einstein has imported curvature into Special Relativity. The metric tensor is one of the two main tensors in the math of General Relativity, and he has already "derived" it by page two, equation 4 of the proof. All he has done is written x,y,z,t as a 4-vector, and put that in a 4x4 matrix, and GR is now curved. That was all it took to make SR into GR. This is called a proof by fiat.

Although Einstein sanded off a few of the roughest parts of this section 1 between 1920 and 1922, in its current form it is still a bald assertion posing as a proof. If anything, he actually made it shorter and less transparent. He removed a couple of the biggest contradictions, but added nothing to clarify the very strange movement of his argument. As it now stands, some 90 years later, his derivation of the metric tensor is not really a proof at all, or even a demonstration. It is simply an amateur introduction to matrix math, with a gravitational field slipped in while you aren't looking.

What we should ask Einstein, given this argument is, "Does this mean that *any* use of non-Euclidean geometry necessarily implies a gravitational field? It looks like all you have done is express four variables in an equation, put them in a matrix, and automatically gotten gravity to appear. You didn't even need to invoke a force of gravity, a mechanism of gravity, or a mechanism of curvature. All you did was put a 'point-mass' into a space, and the whole space became curved." Notice that this point-mass isn't acting on other mass. There is no other mass in the space. It is acting on other empty points or differentials. The point-mass isn't attracting other bodies, it is *bending* empty straight lines. Our point mass is bending things *that don't exist*.

It also appears to be bending *its own* path. Its existence in the field is enough to curve its own path! Isn't this an instance of a body causing motions on itself?

Well, maybe not. Is it our introduced point-mass that is bending these empty straight lines, including the empty straight lines in its own path? Or are the empty straight lines actually being bent by the math itself? If we look closely, we see that space is not being curved by our introduced point-mass. Empty space is curved here because the mathematical space in non-Euclidean math is *already* curved. That is what Einstein meant when he said, We thus deduce the conception that $g_{\sigma\tau}$'s describe the gravitational field. Since *any* tensor field will have similar $g_{\sigma\tau}$'s, we may deduce that *any* tensor field can be called a gravitational field, provided the person using the tensor field *wishes* to call it that.

Either way, we aren't in the presence of physics. Points bending empty straight lines is not physics. For it to resemble physics in any conceivable way, we would *at least* have to have a mechanism for that bending. The point is bending the empty straight line *how*? Or, if the math is bending the empty straight line, we have to be shown how that is physics. Isn't that math, not physics? In the real world, math cannot bend empty straight lines. If you think it can, I encourage you to draw a point on a piece of paper and then monitor it for such action. See if your point begins to bend straight lines around it. If it does so, please get back to me. I will immediately admit my error.

From this, we can see that Newton's theory was superior to Einstein's, as a matter of mechanics. Although Newton could provide no mechanism for his gravitational force across empty space, at least he did us the favor of having matter act upon matter. He also did us the favor of giving his matter some real extension, and tying the amount of force to that extension. Here, Einstein has given us a material point with either zero or infinitesimal extension, and then proposed that this material point acted *upon nothing*. His material point is acting upon its own future path, as well as upon all empty lengths around it. If you find that to be a historical advance, I don't know what to say. If you are a physicist, you may be in the wrong field. You might be more qualified in sorcery.

In Part 2, I will continue to unwind Einstein's derivation of the General Theory, including his proof of the field equations. We will look at the stress-energy tensor, the Ricci tensor, and the form of the equations in general.

*This proof starts on page 119 of the Dover edition of *The Principle of Relativity*.

**Some of these quotes appear in the original paper in "Annalen der Physik" and the original *Principle of Relativity* edited by Saha and Bose in 1920. They do not appear in the Dover edition, which is strange in itself. The preface to the Dover edition tells us their text is translated from the 1922 *Principle of Relativity*, 4th edition, Teubner. Apparently Einstein cut some text between 1920 and 1922.