392(4): Violation of Antisymmetry by the Newton and Einstein Theories of Gravitation.

The scalar antisymmetry law of physics is:

$$\underline{g} = -\underline{\nabla}\phi + \underline{\omega}\phi = -\frac{\partial \underline{Q}}{\partial t} - \omega_0 \underline{Q} \quad -(1)$$

where the spin connection is:

$$\omega^\mu = \left(\frac{\omega_0}{c}, \underline{\omega}\right) \quad -(2)$$

Newton Theory

$$\underline{g} = -\underline{\nabla}\phi = -\frac{\partial \underline{Q}}{\partial t} \quad -(3)$$

so

$$\omega^\mu = 0. \quad -(4)$$

In eq. (3)

$$\phi = -\frac{mG}{r} \quad -(5)$$

and

$$\underline{g} = -mG\frac{\underline{r}}{r^3} \quad -(6)$$

where

$$\underline{r} = X\underline{i} + Y\underline{j} \quad -(7)$$

and

$$r^3 = (X^2 + Y^2)^{3/2} \quad -(8)$$

so

$$\underline{Q} = mG\int \frac{\underline{r}}{r^3}\, dt \quad -(9)$$

There is no interaction with the vacuum so

$$\underline{\omega}\,\phi = -\omega_0 \underline{Q} = \underline{0} \quad -(10)$$

and

$$\omega_0 = 0, \quad \underline{\omega} = \underline{0}. \quad -(11)$$

From eq. (9):

$$Q_X = mG \int \frac{X}{(X^2+Y^2)^{3/2}}\, dt \quad -(12)$$

$$Q_Y = mG \int \frac{Y}{(X^2+Y^2)^{3/2}}\, dt \quad -(13)$$

so in general:

$$Q_X = Q_X(X, Y) \quad -(14)$$

$$Q_Y = Q_Y(X, Y) \quad -(15)$$

The vector antisymmetry law of physics is, in a plane:

$$\frac{\partial Q_X}{\partial Y} + \frac{\partial Q_Y}{\partial X} = \omega_X Q_Y + \omega_Y Q_X \quad -(16)$$

From eq. (11) the right hand side is zero, but from eqs (14) and (15) the left hand side is not zero. So the Newton theory violates antisymmetry conservation, Q.E.D., i.e.:

$$\boxed{\frac{\partial Q_X}{\partial Y} + \frac{\partial Q_Y}{\partial X} \neq \omega_X Q_Y + \omega_Y Q_X} \quad -(17)$$

Furthermore, the concept of the gravitational vector potential $\underline{Q}$ does not exist in the Newton theory.

) The integrals in eqs. (12) and (13) can be evaluated using:

$$X = r\cos\phi, \; Y = r\sin\phi \quad -(18)$$

and

$$r = \frac{\alpha}{1+\epsilon\cos\phi} \quad -(19)$$

in which:

$$r^2 = X^2 + Y^2 \quad -(20)$$

So:

$$Q_X = \frac{mG}{\alpha^2}\int \cos\phi\,(1+\epsilon\cos\phi)\,dt \quad -(21)$$

$$Q_Y = \frac{mG}{\alpha^2}\int \sin\phi\,(1+\epsilon\cos\phi)\,dt \quad -(22)$$

From Lagrangian theory:

$$\frac{d\phi}{dt} = \frac{L}{mr^2} \quad -(23)$$

so:

$$dt = \frac{mr^2}{L}\,d\phi$$

$$= \frac{m}{L}\,\frac{\alpha^2}{(1+\epsilon\cos\phi)^2}\,d\phi \quad -(24)$$

So

$$Q_X = \frac{mMG}{L}\int \frac{\cos\phi}{1+\epsilon\cos\phi}\,d\phi \quad -(25)$$

$$Q_Y = \frac{mMG}{L}\int \frac{\sin\phi}{1+\epsilon\cos\phi}\,d\phi \quad -(26)$$

+) where

$$\phi = \tan^{-1}\frac{X}{Y} \quad -(27)$$

Using the Wolfram integrator:

$$\int \frac{\cos\phi}{1+\epsilon\cos\phi}\,d\phi = \frac{1}{\epsilon}\left(\phi - \frac{2}{(\epsilon^2-1)^{1/2}}\tanh^{-1}\left(\frac{(\epsilon-1)\tan(\phi/2)}{(\epsilon^2-1)^{1/2}}\right)\right) \quad -(28)$$

and

$$\int \frac{\sin\phi}{1+\epsilon\cos\phi}\,d\phi = -\frac{1}{\epsilon}\log_e(1+\epsilon\cos\phi) \quad -(29)$$

So in general:

$$\frac{\partial Q_X}{\partial Y} + \frac{\partial Q_Y}{\partial X} \neq 0 \quad -(30)$$

Q.E.D.

Einstein Theory

In EGR:

$$\underline{g} = -mG\frac{\underline{r}}{r^3}\left(1 + \frac{3L^2}{m^2c^2r^2}\right) \quad -(31)$$

$$= -\underline{\nabla}\phi$$

where

$$\phi = -\frac{mG}{r}\left(1 + \frac{L^2}{m^2c^2r^2}\right) \quad -(32)$$

It follows that:

$$\omega^\mu = \left(\frac{\omega_0}{c}, \underline{\omega}\right) \quad -(33)$$

5)

$$\underline{g} = -\underline{\nabla}\phi = -\frac{\partial \underline{\Omega}}{\partial t} = -mG\frac{\underline{r}}{r^3}\left(1 + \frac{3L^2}{m^2c^2r^2}\right) \quad -(34)$$

To a very good approximation, the Newtonian de of eqs. (25) and (26) may be used to show that eq. (17) is also true for the Einstein theory.

The Einstein theory violates conservation of antisymmetry.