155(13): Criticism of the Mass Variation Procedure of Einstein.

In light deflection due to the sun, the mass M of the sun is a constant:

$$M = 1.989 \times 10^{30} \text{ kgm.} \quad -(1)$$

Therefore:

$$\delta M = 0. \quad -(2)$$

By definition:

$$\frac{\partial \Delta \phi}{\partial M} = \lim_{\delta M \to 0} \left(\frac{\Delta \phi (M + \delta M) - \Delta \phi (M)}{\delta M} \right) \quad -(3)$$

The definition (3) requires that δM be non-zero, and this is not the case. For example, consider:

$$f = 2x \quad -(4)$$

then

$$\frac{df}{dx} = 2 \quad -(5)$$

but

$$\frac{df}{d2} \neq x \quad -(6)$$

because 2 does not change.

Therefore $\partial \Delta \phi / \partial M$ is not defined in calculus.

$$-(7)$$

The Maclaurin series is:

$$f(x) = f(0) + x f'(0) + \frac{x^2}{2!} f''(0) + \ldots$$

and in order for this to be defined, $f'(0)$ must be defined.

2) Here $f'(0) = \left.\frac{\partial f}{\partial x}\right|_{x=0}$ — (8)

Einstein uses: $f'(0) =? \left.\frac{\partial \Delta\phi}{\partial m}\right|_{m=0}$ — (9)

presumably as the first term of a Maclaurin series, but this is not defined in calculus.

Finally consider:

$$T = \frac{1}{2} m (v_1^2 - v_2^2) = \int_{v_1}^{v_2} mv\,dv \quad - (10)$$

If we try Einstein's method:

$$\frac{\partial T}{\partial m} =? \frac{1}{2}(v_1^2 - v_2^2) \quad - (11)$$

and

$$\left.\frac{\partial T}{\partial m}\right|_{m=0} =? 0 \quad - (12)$$

so

$$T(m) =? T(0) + m T'(0) + \ldots \quad - (13)$$

$$=? 0$$

and

$$\left. m \frac{\partial T}{\partial m}\right|_{m=0} =? 0. \quad - (14)$$

The correct result is of course eq. (10). This is one out of an infinite number of counter-examples to Einstein's method.