The first term is the contribution to δr due to the photon's motion during an interval of proper time. So the partial derivative in the first term is simply the photon's speed c in those coordinates:

$$\frac{\partial r}{\partial \tau} = c \qquad (ii)$$

The second term in eq (*i*) is the instantaneous (because τ has to be held constant in the second term) contribution to δr corresponding to an instantaneous change of proper distance $d\ell$ that would, for example in my paper, be induced by an instantaneous (if such were possible) change of gravitational potential. Put eq (*ii*) into eq (*i*) to get:

$$\delta r = c\,d\tau + \frac{\partial r}{\partial \ell} d\ell \qquad (iii)$$

Mr. Upton then turns my eq (12) around to get his eq (6), which I reproduce here:

$$dr = \left(1 + \frac{2\Phi}{c^2}\right)^{1/2} d\ell \qquad (iv)$$

Right after his eq (6), he makes the mistake, not in an explicit equation, but implicitly in his words [italics mine]:

> '*Comparing* these [eqs (5) and (6)] with equations (3) and (4), we find ...'

To make the comparison, he assumes that the *dr*'s of his eqs (4) and (6) represent the same quantity. Using my symbols, he was comparing my eqs (iii) and (iv) and *assuming* that

$$\boxed{\delta r = dr \ (???)} \qquad (v)$$

He doesn't justify this assumption. If it were correct, it would require the $d\ell$ terms in eqs (*iii*) and (*iv*) be equal, getting his eq (10). It would also require that the photon speed c in eq (*iii*) be zero. That is clearly incorrect, because in relativity, photons can't have zero speed in any frame of reference. So his key assumption, spelled out by my eq (*v*) above, is wrong. If you correct the wrong assumption and follow the effect through the remainder of his letter, you will see that it derails his train of thought and wrecks his conclusions.

Why did Mr. Upton make this mistake? I think he was misled by similar notations in different fields. Calculus textbooks use symbols like '*dr*' to represent total differentials, so he naturally chose that to represent the total derivative in his eq (6). Then it was very natural to slip into thinking of the common general relativity symbol '*dr*' in my equations as being the same thing.

To sum up, Mr. Upton misidentifies my quantity *dr* as a total differential and then shows contradictions that stem only from his misidentification. Knowing my own proneness to error, I'm glad that he did not find a real problem with my math.

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Tidal considerations

In contemplating the flood of Noah's day one has to consider the effects of tidal considerations. Not having seen any articles concerning this topic in creationist literature over the years is it possible that anything relating to this topic has been published?

The following questions come to mind:

1. Would there even have been a tidal surge? Presumably, since the moon and sun were in existence.
2. How large would this tidal surge be (depth)? What would be the depth differentials and the resultant bottom pressure?
3. Would the tide have a diurnal cycle of reversal or continue around the globe since there was no landmass to prevent it? If it continued unabated would there be a continuous shallow/deep area?
4. If it continued around the globe would vortices form at the polar regions? Would these vortices pull debris from the water toward the bottom?
5. Would severe waves (breakers) be formed when the tides passed over shallower areas?
6. Could tides account for the deposition of sedimentary rock layers?
7. What might be the scouring effect of such tides?
8. Could these tides affect the earth's rotation?

These are just a few of the considerations that might be addressed. You probably can either dismiss most of these as not worthy of consideration or find more significant issues. Since my field of expertise is medical physics it is be beyond my purview to investigate these questions. Hopefully your experts in hydrology and geology can add to our understanding in this regard.

Thanks for a great journal. It is a wonderful source of information to me even after 40 years of creationist studies.

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Editors reply:

Clark and Voss[1,2] have published papers at the International Conference on Creationism about possible tidal oscillations during the Flood. However, not all of your questions have been addressed, and they would form the basis for worthwhile research projects.

Journal of Creation Editors
Brisbane, Queensland
AUSTRALIA

References

1. Clark, M.E. and Voss, H.D., Resonance and sedimentary layering in the context of a global flood; in: Walsh, R.E. and Brooks, C.L. (Eds.), *Proceedings of the Second International Conference on Creationism,* vol. 2, Creation Science Fellowship, Pittsburgh, PA, pp. 53–63, 1990.
2. Clark, M.E. and Voss, H.D., Toward an understanding of the tidal fluid mechanics associated with the Genesis flood; in: Walsh, R.E. (Ed.), *Proceedings of the Third International Conference on Creationism*, Creation Science Fellowship, Pittsburgh, PA, pp. 151–169, 1994.