Distant starlight and Genesis

Robert Newton's paper, 'Distant starlight and Genesis: conventions of time measurement', in *TJ* **15**(1), has just come to my notice.[1] In order to allow for all distant stars to be created on Day 4 of Genesis 1 and to be visible on Earth immediately they are created, he relies on 'observed time' using a non-standard synchronization of distant clocks under which, in his own words, 'light travels instantaneously from stars to Earth' (p. 81). By this he means light from all stars, in whatever direction they are seen.

However, non-standard synchronization can give infinite one-way velocity of light only in one direction *in space*. In all other directions in space the velocity takes various finite values. A general three-dimensional treatment[2] yields the following formula for $c'(l)$, the one-way velocity of light in the direction of an arbitrary unit vector l:

$$c'(l) = c /(1 + \xi \cdot l/c),$$

where c is the 'canonical speed of 1,079 million km/hr' and ξ is a constant vector parametrizing the synchronization. The value of c' is infinite if and only if ξ is taken to be of length c and $l = -\xi/c$.

For example, relative to a particular point on the earth's surface, if light arrives instantaneously from a star directly overhead, then it arrives with velocity c from a star at any point on the horizon. (In this example the angle θ in Reference 3 of Newton's paper is the zenith distance.)

Consequently, the use of observed time does not help in understanding Day 4 in Genesis 1.

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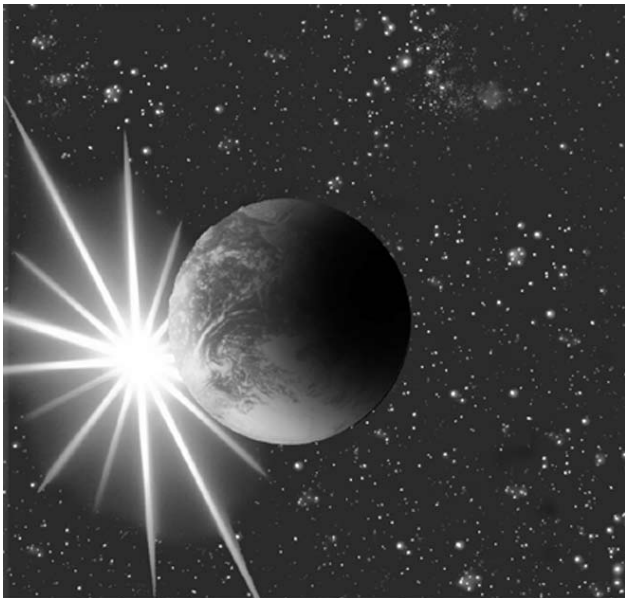
References

1. Newton, R., Distant starlight and Genesis: conventions of time measurement, *TJ* **15**(1):80–85, 2001.

2. Stone, A.P., Non-standard clock synchronization in special relativity and the hypothetical ether frame, *Found. Phys. Lett.* **4**(6):581–591, 1991.

Robert Newton replies:

Anthony Stone has defined a synchronization standard in which the speed of light is infinite in one absolute direction in space defined by the vector ξ of magnitude c (the canonical speed of light). This is a perfectly acceptable convention and would lead to the results he describes; namely, light would arrive instantly from stars only in one direction in space, but would take time for stars in other directions. However, this convention is not the 'observed time' convention used in my *TJ* paper on the subject. The difference is that in Stone's synchrony convention, ξ is a constant of the universe—an absolute direction in space. But in the 'observed time' convention, ξ is a function of the position in space relative to Earth. That is, for a given position in space, ξ points directly away from the earth.



Using spherical coordinates with the earth at the centre, we find that $\xi(r,\theta,\varphi) = c\,\hat{r}$. Here, $\hat{r}$ is the unit vector pointing away from the earth for any given position. So the equation for the speed of light (as measured in 'observed time') moving in the direction of unit vector l becomes:

$$c'(l) = c/(1 + l \cdot \hat{r}),$$

where c is the canonical speed of light as measured in 'calculated time'. Notice that this equation can be derived from the conversion between calculated time and observed time that was included in my original paper: $t_c = t_o - r/c$. In the 'observed time' convention the speed of light is always infinite when directed *toward the earth*, and finite in any other direction. This follows logically from the above equation for c' since the direction toward Earth is always opposite of r

For example, light below Earth's south pole would move infinitely fast when traveling due North, but light above Earth's north pole would move infinitely fast when traveling due South. This concept was not clear enough in my original paper, so I appreciate Anthony Stone's comments and the opportunity to clarify. It should now be clear that the 'observed time' convention will indeed get distant starlight to the earth instantly in all directions in space—if this is indeed the convention that God uses in Scripture. And that is the real issue.

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