

is irrational, or absurd. But it is an *assumption*—one which is fundamentally, empirically non-testable. One can choose to accept this convention and dismiss others (such as the observed time convention) as phenomenological on the basis of *simplicity*. I respect this choice; certainly calculated time (with an isotropic speed of light) is simpler mathematically, and conceptually. It is just rather fascinating that other conventions (in which the speed of light is *not* isotropic) cannot be eliminated by *empirical experimentation*. This is a remarkable result, and would not be true in a classical universe. If it were not for Relativity, instantaneous two-way communication would easily allow for absolute clock synchronization.

Stellar aberration is similar. In order to determine the angle at which a moving telescope is pointed, we must know the position of the top and the bottom of the telescope *at the same time*. Clearly, a synchrony convention must be assumed in order to determine this. Stellar aberration, Roemer's experiment, and other light-speed experiments are discussed in Wesley Salmon's article² 'The philosophical significance of the one-way speed of light'. I highly recommend this article to those interested in the conventionality (or non-conventionality) of simultaneity.

I'm happy to clarify the meaning of theta in the equation for observed time light propagation.³ Theta is the angle made between the velocity vector of a photon, and a line connecting its position to the observer. Thus, any photon aimed directly at an observer on Earth would have theta = 0, and its effective speed would be infinite. So, observers on Earth would be able to see stars at great distance in all directions. This formula for the speed of light as measured in observed time can be derived from the conversion between calculated time and observed time ($t_c = t_o - r/c_o$) and the fact that *c* is constant and isotropic in calculated time. Here, 'r' is the distance from an observer to the photon. This is all done in spherical coordinates with Earth at the origin.

Thanks, Dr Hartnett, for these comments. I encourage *TJ* readers to

build on my model and feel perfectly free to consider observed time to be merely phenomenological. This approach may be better in a practical sense since the conventionality of simultaneity is controversial, and since the model I have proposed should solve the distant starlight problem either way. I believe the model is the simplest Biblically compatible solution to starlight so far. The section 'An alternative perspective' in my original paper describes the creation process in the standard 'calculated' time. In this view, the creation of stars continues inward in concentric spherical shells at the speed of light. This would be seen as instantaneous from Earth's perspective. Could the recent reports of quantized redshifts support this model? It seems that matter in the universe is distributed in concentric shells at preferred distances from Earth.⁴ Could God have created in spurts (in calculated time)? And might this be a hint of this Earth-directed display—an 'echo' of God's creative power?

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References

1. Newton, R., Distant Starlight and Genesis: conventions of time measurement, *TJ* 15(1): 80–85, 2001.
2. Salmon, W.C., The philosophical significance of the one-way speed of light, *Nous* 11(3): 253–292, Symposium on Space and Time, 1977.
3. $c = c_o / (1 - \cos(\theta))$
4. Humphreys, D.R., Our galaxy is the centre of the universe, 'quantized' red shifts show, *TJ* 16(2):95–104, 2002.

Evening and morning

I was pleased to read Mr Kulikovsky's *Viewpoint* on the phrase 'evening and morning' which recurs throughout Genesis chapter 1.

While there has been much ink

spilt over the years as to the putative lack of a light source to create the fluctuation of lighting conditions which is our normal diurnal experience, I think it has missed the point. Mr Kulikovsky makes that point. That is, the author appears to be making certain we understand what these days are in which creation events occur. Are they long days, metaphorical days, indeterminant length days, etc.? No, they are evening and morning type days.

Looking at it another way, and setting aside the various views held of the duration of these days and the meaning of 'yôm', how would an author unambiguously convey the meaning of our normal 24 hour day? I can't think of a better way than repeating that the days are characterised as 'evening and morning' type days.

The message from Genesis chapter 1 by virtue of this phrase is that the author is telling us precisely about passing duration. It is described so as to convey clearly the duration that passes. Much exegesis strains at avoiding this issue, making all sorts of assumptions about the state of mind of the author and the intention of the Holy Spirit in inspiring these words, but they must strain to go past the direct meaning of the text: six evening and morning type days pass. It is similar to the straining of meaning we get with the chronologies in Genesis chapters five and eleven where explanations are sought apart from that which comes directly from the text: the author is providing a chronology in precise terms. Why else would precise enumeration of durations of life be given?

It more than hints of hubris, I think, when some exegetes looking at the text blithely set aside its direct meaning to put into the author's mind some other meaning not implied by the text, but developed from the text 'deconstructed' in true, if unacknowledged, post-modern fashion.

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