

gives us no reason to believe that carnivory began (**as the norm**) before the Flood, and many compelling reasons to believe that it did **not** do so. I see nothing in Woodmorrappé's letter that clearly alters—or even adequately addresses—this position.

David Larsen
Pasadena, California
UNITED STATES of AMERICA

Distant starlight and Genesis: conclusions incorrect

While Robert Newton¹ has some interesting and seemingly logical arguments for distinguishing between observed time and measured time concepts, I am of the opinion that, although the premise may be true as to proper interpretation of relative time, the conclusions are incorrect. The reasons that I have this conclusion are based on the following:

The first problem is that Genesis 1:1 uses the Hebrew word '*bereshith*' or Greek '*en arche*', for our English interpretation 'in the beginning', which (although I am not an expert in Biblical Hebrew) I understand from several commentators (Henry Morris being one of them) has the force of meaning that it refers to the absolute beginning of time, space, and matter. If the conclusion of the author is to be considered, then this word has to be translated the way more liberal scholars would have it mean, namely that this is when God began His creating. But I would prefer the more conservative and more exacting translation as the absolute beginning of everything no matter what time reference is used to start with. The author would have God create out at the ends of the universe and work His way inward slowly. Since God spoke everything into existence that first day, and especially since the text strongly implies that the Earth itself was created first and then

the heavens, it doesn't make sense to have the galaxies and stars created first in calculated time to correspond with an observed time that is simultaneous with everything else on the first day.

The second problem is that God in many Scripture places (Isaiah 34–51 in particular) mentions that He stretched out the expanse or the firmament sometime during the 2nd to 4th days of Creation week. This again strongly implies that the space for the complete universe started on the first day to be not much larger than the Earth itself and empty. God then expanded the space-time-matter continuum by the fourth day and placed in it all the stars and what not after calling them into existence. The straightforward reading of the text for the events of the fourth day sounds like He made stars and such near the Earth and then moved them into positions with rotational velocities in the expanding expanse.

It may seem good to have an alternate explanation to previous scholarly attempts that seems logical to explain how the light from distant heavenly objects reached Adam and Eve on the sixth day, but it is really not necessary. In spite of all the explanations presented over the years, it still seems to me that Russ Humphreys' proposal seems the best explanation at this present time that considers all the Biblical implications. The only problems that I have seen with Russ's theory is that the liberal and evolutionary minded folks don't buy into it. Not a technical objection, but a political one. I can appreciate the suggestion that the author presents about how time is determined, when the Long Day of Joshua is considered. We more or less all agree that it was not the sun that stood still, it was the Earth given the language of relative reference. (Another example is that we still say the sun rises and sets, but we recognize that we are using an observational reference frame.) But to have God creating constantly over billions of years just doesn't sit well. When he says that everything was done in 6 days, what reference time frame makes sense and is consistent with all of Scripture? No one was there to observe in any time frame, so what

other conclusion would there be than to accept an absolute and try to find the truth on that basis? Why does the author say that 'in the beginning' **must be observed** time? The conclusion does not prove the original premise.

Jim Hovis
Rio Rancho, New Mexico
UNITED STATES of AMERICA

Billions of years??!!

I don't mean to be 'splitting hairs' but in his article Robert Newton says 'first, God creates the most distant sections of "space". **This occurs billions of years ago.** About four days later, stars are created in those areas of space.' You often mention how the little things in life can do the greatest damage.

Newton seems rather steadfast on this idea of 'billions of years' because he mentions it a number of times. Since he carries some heavy credentials by worldly standards, I believe that this needs some looking into. Oh! By the way, I enjoyed the rest of his article.

David A. Link
Seattle, Washington
UNITED STATES of AMERICA

The paradox of light travel

I am indebted to the thinking of Robert Newton and the insight he offers in his paper, *Distant starlight and Genesis: conventions of time measurement*. It has been my view for sometime that Einstein's Special Theory of Relativity gives a clue to the paradoxical nature of time, and when applied to the question of starlight travel that a more consistent understanding of the Creation process can be rendered. Newton has aided in this regard, but he has missed a key point in coming to grips with the recent creation of the universe. A proper

understanding of the Genesis account and Special Relativity Theory makes it possible to view time, in its totality, as a unified field, eliminating the need to conjecture always two times (and two clocks) which are both correct though divergent to the tune of billions of years.

Observed time is actually real, or pure time, not requiring the inclusion of distance or tangential observation to be incorporated into some formula. In this regard ‘Newton’ makes the central point: ‘[Light] moves infinitely fast when travelling directly toward the observer—travelling instantly from point A to point B’.

The Theory of Relativity does not permit things of substance to achieve the velocity of light; but obviously a light pulse can and does travel at the speed of light. ‘From the point of view of the pulse, no time at all elapses as, in our frame of reference it sweeps across the solar system. It is here, then it is there—instantly’ (Davies, *About Time: Einstein’s Unfinished Revolution*, p. 190).

For according to the Special Theory of Relativity, at the inherent speed of light, space is infinite (without dimension), and time is without duration. In real, observed time, with light ‘moving’ from point B (a far distant star) to point A (an observer on Earth), at light’s intrinsic velocity, distance is not a factor as the dimensional/durational aspect of the star-light is **infinitely** instantaneous!

The conundrum presented when toying with calculated time as the field of astronomy is prone to do, is that the artifice known as *light-year* is really—and only—a measurement of distance, where time is used as the measuring device when dealing with distances too vast to be computed in conventional ways. In other words, artificial time can be used to measure distance; however, in real time (observed time) distance cannot be used as a measure of time at the inherent velocity of light.

Nathan R. Wood, a contemporary of Einstein, in his *Secret of the Universe* (1936), identified *light-years*

as a unit of measurement as being the result of the finite limitations of our mind:

‘Because we cannot grasp more than a certain number of smaller units of distance, we combine them into larger units for our mental convenience. It is exactly as when, to avoid too great a number of inches, we say feet, instead of inches, or when, to avoid too great a number of feet, we say miles instead of feet.

‘In time-measurements, also, when seconds grow too many, we say minutes, and when minutes become too many, we say hours, and when hours multiply too largely, we say weeks, and when weeks add themselves into a great total, we say years.

‘We manufacture larger units to bring the total number better within the grasp of our minds. We manufacture light-years simply as a larger unit of measurement. If the use of time in measuring distance lay in the real nature of measurement of space, we should have to use time in all measurements of space. We should have to use it as a factor in measuring short distances. But we do not use it so at all.

‘We do not use time as a factor in measuring feet or meters, or in measuring miles on the Earth. The only people who use it so are those whose mental ability is so low that they cannot compute space distances at all, and who say, ‘It is so many days’ journey,’ or ‘so many hours’ journey,’ or ‘it is as far as a horse would travel between sunrise and sunset....’

‘It is all a matter of constructing larger units of measurement so as to bring down the total number of units to the range of our comprehension. It does not at all show that time is a dimension of space [pp. 149–150, emphasis added].’

In all of this, we should not think we have the liberty to define, develop, or discriminate different notions of time. Such capricious-

ness only lends confusion to reality, and in this instance forces Newton to explain away the logical conclusions emanating from a calculated view of time. To his credit, Newton rejects old-Earth Creation and anti-Biblical views, and holds firmly to the 6,000-year age of the universe.

But that is what the actual reading of Genesis and real time leads us to anyway. Calculated time is simply the tool (too frequently misapplied) to help us deal with the phenomena of immense distance as we peer into the heavens. The starlight one views in the most distant sky we see instantly, not as if it left the celestial body 16 billion years ago only to be observed today. When looking into the heavens we are seeing the present, not the past as happening immense ages ago, at the beginning.

There is clearly much that needs to be done in understanding and applying Special Relativity Theory and Lorentz-FitzGerald contraction notions, as well as proposals being made by Humphreys and Van Flandern pertaining to The General Theory of Relativity to cosmic age; but it can be safely said that the historic reliance on the uniformitarian assumption of calculated light-years as a measurement of the time-span of the universe is rapidly passing. Defining the paradox of light travel is next; applying it to an understanding of the Creation Account will soon follow.

Bruce Schweigerdt
Lodi, California

UNITED STATES of AMERICA

Nothingness

At first glance Robert Newton’s article *Distant starlight and Genesis: conventions of time measurement* appears to be the inverse of Russell Humphreys’ description of the formation of the initial universe. Newton starts at the far edges of the universe, while Humphreys starts at a singularity. But an important concept in both explanations is the concept of nothingness.

From grade school on up the concept of infinity is taught as instructors try to expand the minds of youth. But the concept of nothingness is largely ignored. Yes the idea of zero is taught, but even zero has a point on a number line. Nothingness goes far beyond the concept of zero and is perhaps much more difficult to understand intuitively than infinity. And there are the usual philosophical questions on the way to understanding nothingness similar to the proverbial falling tree in the forest. For instance, if all matter and energy were removed from a portion of space, or even all of space, would time progress? And if it did progress, what would it progress relative to? But I have digressed. The real question of nothingness as Humphreys explains it is not just the lack of matter and energy but the lack of space itself. Einstein calls it dimension 'w' or the 4th dimension.

Humphreys' bounded Universe has a sphere of space, matter and energy surrounded by nothingness, while Newton's Universe begins with a sphere of nothingness surrounded by space, matter and energy. Newton's Universe is a little more difficult to conceptualize. How can one measure across a sphere of nothingness if nothingness has no dimensions to measure? I am now faced with a singularity, so to speak, of nothingness. This to me sounds like Humphreys' white fountain. If it were possible to observe Newton's Universe it might appear as if space, matter and energy are being flung instantaneously from one end of the Universe to the other, similar to the description of an atom in a quantum mechanics text book with an electron being in one position and then instantaneously appearing at another position in the orbital without necessarily following an arc.

I appreciated Robert Newton's article and hope to see some more writing by him.

Wayne Stowell
Ferndale, Washington
UNITED STATES of AMERICA

Kelvin vs. Celsius

Observed Time versus Calculated Time—an interesting argument! As yet it doesn't appeal to me like Humphreys, so it will be interesting to see the correspondence. However I just wanted to put forward a suggestion to the author re any future revamps of the theory or article.

I found the 100-cm vs. 1,000-mm measurement concept not as helpful as it could be. The problem is that centimetre and millimetre have different scales whereas observed and calculated time are usually discussed in the same time scale but with a different frame of reference. While we could argue that 100 cm corresponds to speed towards the observer while 1,000 mm corresponds to speed away from the observer, that is speed not time, and I think that there may be better analogies.

The best analogy I can think of is Degrees Kelvin ('absolute') versus Degrees Celsius (referenced to water phase changes at STP). However, to keep things more accessible to lay readers why not use degrees Celsius and degrees Fahrenheit. Here there are two arbitrary frames of reference (water vs. Fahrenheit's original thermometer). OK the scales are different, i.e. the same problem as for mm vs. cm, but I think it is a good compromise as it has different frames of reference.

Peter Newland
Melbourne
AUSTRALIA

What about the redshifts?

I would just like to thank Mr Robert Newton for his paper entitled *Distant starlight and Genesis: conventions of time measurement*. I had never let such a conception enter my mind, accepting more complex models for this puzzle of distant starlight in a young universe, such as Doctor Humphreys'. I had

never thought that God could have created the stars at different times before Creation so that the light could reach Earth on Day 4 of Creation. Then God would seem to have created the stars on Day 4, indeed would have created them using observed time as the method of dating their creation. Also, in Genesis 1:16 the words 'He made the stars also' seem set apart from the rest of the verse. Perhaps this is so because God might have created the stars at a different time (assuming calculated time) to the Sun and Moon. It seems to me that these words are just confirmation that God did create the stars, so that no speculation could be made that He didn't. In other words, they could be there just for the record. But, I am a firm believer in not 'mincing' God's Word, and they are probably set apart because of the lesser importance of the stars to our survival. Let us just hope and pray that the stars obtain their original purpose, to bring glory to their Creator. To finish, I would just like to ask Mr Newton how he would explain the redshift pattern? This is just one flaw to an otherwise simple but ingenious explanation to such a puzzling problem.

David Pfeiffer
Wrexham, Wales
UNITED KINGDOM

The 'central' part missing

I thought the article entitled *Distant starlight and Genesis: conventions of time measurement* by Robert Newton was unusual. It implies mature creation with respect to nearby white dwarfs etc., and a universe with the 'central' part missing for much of its 'calculated time' history. Yet Newton does not mention these implications or address the issues arising from them.

Newton's hypothesis has the virtue of respecting all astronomical observations, i.e. it implies that all observed objects and events in the uni-

verse are real. As far as I can see, the hypothesis makes no testable predictions; it is inherently unfalsifiable.

The ‘mature creation’ aspect applies not just to white dwarf stars but also to anything in the universe which appears to require a prehistory exceeding a few thousand years, e.g. any feature related to stellar evolution (such as colour-magnitude diagrams of star clusters), galaxy formation and structure etc. This does not rule out the hypothesis, of course; it just means that it relies heavily on mature creation.

Bill Worraker
Didcot, Oxfordshire
UNITED KINGDOM



Robert Newton replies:

I thank the many contributors of the letters regarding my paper. I appreciate the positive comments and the constructive criticisms. And I am pleased at the opportunity to clarify some of my ideas here.

Jim Hovis mentions the Humphreys model. The Humphreys model is clever, and I would be very pleased if it could be reconciled with the apparent expansion rate of the Universe. My point is simply that regardless of the validity of the Humphreys model, distant starlight is not a problem since

the Biblical convention uses observed time rather than calculated time.

David Link is concerned about my use of the phrase ‘billions of years’. This brings up a worrisome trend I find among many creationists. Is the issue really one of age, or is it one of authority? I believe in six days of Creation because God’s Word says so, but we must be careful not to impose outside ideas on the Bible. Many people have the (scientifically unsound) idea that time is absolute—that all clocks run at the same speed everywhere no matter what. Imposing this idea on Scripture, they then conclude that the universe is 6,000 years old regardless of reference frame or synchrony convention. But the Bible says no such thing. It only tells us that God created in six days but does not explicitly state the reference frame or synchrony convention.

I believe the reference frame must be that of the Earth (since the Bible was written for mankind—and also because a ‘day’ is defined by Earth’s rotation), and the synchrony convention must be that of observed time (since this convention best preserves the perspicuity of Scripture, as was discussed in my paper). Now, Relativity requires that if the universe is 6,000 years old as measured by clocks on Earth, it definitely will not be 6,000 years old as measured by other clocks in some other velocity (or gravitational) reference frames. Indeed, light does not experience time at all as Bruce Schweigerdt mentions in his letter. From light’s point of view, the age of the universe is zero.

For the record, I am convinced that God created the universe and everything in it in six ordinary days as measured by clocks on Earth and, I believe, according to the observed time convention. Other reference frames and other synchrony conventions must give different ages according to Relativity. A hypothetical observer on Earth would have seen God create in six consecutive, approximately 24-hour days, and would have seen the stars created on day four. A hypothetical observer in the

Andromeda galaxy might have seen something quite different—the Bible just doesn’t say.

I like Peter Newland’s thermometer analogy—comparing observed time and calculated time to Kelvins and degrees Celsius which both use the same units but with different zero points. The purpose of the original analogy was to illustrate the concept of conventions of measurement. Different conventions of measurement make different ‘predictions’ about the length of a table or the temperature of a room. Yet both are correct. The issue here is that the one-way speed of light is not a measurable quantity—but a defined convention. As such, alternate conventions are possible.

Both Bill Worraker and Wayne Stowell address the concept of a universe that is ‘empty’ in its inner portion during the creation process—a concept I addressed in my paper. This emptiness exists only in the calculated time convention. If an event (with spatial extent) occurs instantly in the observed time convention, it must be non-instantaneous in the calculated time convention (and vice versa). If stars were created everywhere and instantly on day four according to observed time, then this event will not be instantaneous as measured according to calculated time. Indeed, the creation event would proceed inward at the speed of light as measured according to calculated time.

The creation of spacetime itself may have proceeded in a similar fashion—four days before the stars. Alternatively spacetime may have been created as a singularity and rapidly expanded as Dr Humphreys has suggested. (Such an expansion would be compatible with observations if it occurs almost entirely before the creation of stars. A substantial expansion after the creation of stars would seem to be inconsistent with observed redshifts.) An origin as a singularity avoids the difficulty of spacetime having an ‘edge’ as viewed in calculated time since a singularity has no spatial extent. At any rate, space would

indeed be empty of stars in its inner region for much of its (calculated time) history. As viewed in observed time (from Earth), the creation of stars would be instantaneous.

David Pfeiffer asks about the redshift of starlight. Recall that observed time vs. calculated time is only an issue of clock synchronization—how we define time at a given point in space. Thus, any given physical phenomenon will happen identically regardless of which set of spacetime coordinates we assign to it. If a given object is redshifted (for whatever reason) when we measure quantities in calculated time, it will have the same redshift when we use observed time coordinates. The redshift of galaxies is caused by the expansion of the universe—in both calculated and observed time. This is a consequence of general relativity. But let us examine the analogous special relativistic redshift since it is easier to describe.

Suppose a spaceship is moving away from Earth at high (near light) speed. It emits light directly toward Earth. We will use calculated time coordinates to analyse what happens. The light appears redshifted on Earth (its frequency has decreased) as the combined result of two effects. First, the moving object experiences relativistic time dilation; its clocks are slowed down and so the light leaves the ship with a decreased frequency. Second, the ship is moving away, so its distance has changed between two successive ‘peaks’ of a light wave. This change in distance makes the wavelength longer than it would otherwise be and therefore decreases the frequency even further. (These two effects are often combined into a single equation—the radial special relativistic Doppler-shift formula).

Now, we examine the same ship moving the same way, but let us use observed time coordinates. First note, that we would measure a different (slower) velocity for the ship (because our spacetime coordinates have changed). Also, we have a modified formula for time dilation, so we

would get a different value for the time dilation here. But, notice that the second effect (the ‘stretching’ of the wavelength due to receding motion) is precisely zero in this case. Since the light moves infinitely fast, its wavelength is now infinite, and the greater distance between ‘peaks’ now makes no difference. Where does this difference go? It is precisely made up in the difference in the time dilation. That is, the effect of ‘wavelength stretching’ due to receding motion is absorbed into the time dilation term. (The wave stretching term is non-zero for light beams not directed radially toward Earth, but the time dilation term always exactly compensates for this.)

So, calculated time and observed time give different values for the velocity, time dilation, and wave stretching effects, but these effects always add precisely to obtain an identical redshift between the two coordinate conventions. In fact, this must always be the case. Since we have only switched coordinates, we must obtain identical measurable results for any given experiment.

Robert Newton
Boulder, Colorado

UNITED STATES OF AMERICA

References

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