# Biblical Evidence for Time Dilation in the Cosmos

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## Abstract

Several Scriptures imply that at the end of this age, presumably not long from now, distant stars will be much older than we see them now. The time required for most stars to get old is many billions of years, yet that much aging must occur within the roughly 6,000 years the Bible says have elapsed on Earth since Creation. Cosmologies using Einstein's gravitational time dilation assert that clocks (and all physical processes) in the distant cosmos once ticked much faster than they did on Earth, so the above-mentioned Scriptures support those theories. But the Anisotropic Synchrony Convention (ASC) cosmology does not allow for time dilation, so the above-mentioned Scriptures are evidence against the ASC view.

#### Introduction

Creationists generally—or at least speaking for myself—have not paid much attention to what the Bible says about the stars in the future. After all, Creation was in the past, so what can Bible prophecy tell us about that? But Scripture tells us some spectacular things will happen in the heavens at the end of the age (cf. Matthew 24:3, 7, 13, 14; 28:20). All Scriptures here are from the NASB translation, and I have put some words in bold font for emphasis. I will take all scriptural passages (most of them here being prophetic) at face value, or straightforwardly, a method many people call "literal interpretation" (Humphreys, 1994). Appendix B outlines the history of various methods for interpreting prophecy.

Because events as great as those at the end of the age (such as Creation, the Flood, and the first coming of Christ) have happened within the past few thousand years, most of us would expect the end of this age to be less, perhaps much less, than a few thousand years into the future. Here are some verses describing the heavens at that time:

> And **the** stars of the sky fell to the earth, as a fig tree casts its unripe figs when shaken by a great wind. And

the sky was split apart like a scroll when it is rolled up. (Revelation 6:13-14)

The stars will fall from the sky, and the powers of the heavens will be shaken. (Matthew 24:29)

Many people assume this falling of stars is merely a large meteor shower. But the Greek word for star in these verses is aster. In New Testament times it meant any bright point in the sky, whether meteor, planet, or what we today mean by a star (Bauer et al., 1979, p. 117). Notice the definite article ("the") I have put in bold font. It is there in the Greek of both passages. That implies that all the stars that exist at that time will fall. A parallel Old Testament passage I will quote more extensively below says explicitly, "All the host of the heaven ... all their hosts ... (Isaiah 34:4; "heaven" is plural, "heavens," in Hebrew)

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will participate in this action. For **all** the stars, even very distant ones, to be seen falling at one time by people on Earth is an extraordinary event.

Steve Miller, an amateur astronomer active in the Creation Research Society a few decades ago, and now with the Lord, believed that God will make (and had already made, he felt) it possible for people to see this starfall in real time, by making the speed of light nearly infinite. He convinced Danny Faulkner of that (I think) and after a few years, me also. In Appendix A I offer a possible way God may do that, by letting the light from a star falling out of the fabric of space travel very rapidly through the *hyperspace* that I think surrounds it (Humphreys, 2014, sections 1 and 3). From any place on Earth, we would perceive the direction of fall as downward, toward the earth. The Greek word translated "to" in Revelation 6:13, eis, which often denotes "simply direction toward someth[ing]." (Bauer et al., 1979, p. 228), so the text does not require that the falling stars actually reach the earth.

#### The Falling Stars Will Be Older Than What We See Now

The parallel passage (partly quoted above) to Revelation 6:13–14 is:

And all the host of heaven will **wear away**,

And the sky will be rolled up like a scroll;

All their hosts will also wither away As a leaf withers from the vine, Or as *one* withers from the fig tree. (Isaiah 34:4)

This implies that the stars will have time to wear out and wither away. That time for most stars is many billions of years. Yet as we observe them now, distant spiral galaxies show only a few hundred million years' worth of rotation (Humphreys, 2005, item 1). Note that according to both conventional cosmology and time dilation cosmologies, we do not see the galaxies as they are at present but rather as they were billions of their years ago (in the case of very distant galaxies). That is because these cosmologies say it took that long for the light to travel to us. Any cosmology having a finite speed of light will have this lookback time. The next section will discuss and illustrate this point in more detail. According to my second cosmology, clocks on Earth would tick off hardly any time at all during most of those billions of years, so that as measured by clocks here, the time elapsed would be only 6,000 years or so. Here are several more Scriptures that suggest that more time has elapsed in the heavens than here on Earth:

- Of old Thou didst found the earth; And the heavens are the work of Thy hands.
- Even they will perish, but Thou dost endure;
- And all of them will wear out like a garment;

Like clothing Thou wilt change them, and they will be changed. (Psalm 102:25–26)

And, "Thou, Lord, in the beginning didst lay the foundation of the earth, And the heavens are the works of Thy hands;

They will perish, but Thou remainest;

And they all **will become old as a** garment." (Hebrews 1:10–11)

It is quite possible that this wearingout applies not only to the heavenly bodies, but also to the heavens, to the fabric of space itself, as "like a garment" suggests. In the case of spiral galaxies, the ones greater than half a billion light-years away would, unseen to us, have wrapped themselves into smooth discs by now (assuming secular theories for the preservation of spiral arms continue to fail). Here is another verse that suggests that the heavens have already acquired great age before the present time:

To Him who rides upon the highest

heavens, which are from **ancient** times ... (Psalm 68:33)

Of course, this is not ironclad proof, because the duration of "ancient times" is open to question.

Another verse that suggests that the heavens have experienced more days than Earth is:

So I will establish his descendants forever,

And his throne as the **days of heaven**. (Psalm 89:29)

Notice the comparison between "forever" and "the days of heaven." Even though Hebrews 1:11 and Psalm 102:25–26 (quoted above), and others (for example, Matthew 5:18) show that the present heavens will not last forever, God chooses to compare the eternal reign of David's descendant Christ with the "days of heaven," implying that there are many more of such days than there have been on Earth. There are alternative ways to understand the verses in Psalm 68 and 89 above, so they are not decisive proof of time dilation. But at first sight, they appear to support it.

## Graph of a Time-Dilation Cosmology

To explain how time-dilation cosmologies would feature such aging of the heavens, I will outline my second one (Humphreys, 2008) as an example, without much explanation of the physics. Figure 1 is a graph showing how I presently imagine it. It follows the relativists' tradition of displaying the time axis vertically, rather than horizontally as an oscilloscope would. To clarify ideas for use in a later section, this graph uses the Einstein Synchrony Convention (ESC). Though Einstein was the first person to define it rigorously, the ESC is merely the way most people have *imagined* past, present, and future since the beginning. That is, they imagined events in the sky as happening "right now." Upon learning that light isn't infinitely fast, they revised their



Figure 1. Space-time graph of latest version of Humphreys' second cosmology. Time is displayed using the Einstein Synchrony Convention (ESC). The Timeless Zone is a region in space-time where clocks (and time itself) tick very slowly. Note that the spiral galaxy moving up the dashed line on the right has turned into a smooth disc at the upper right.

thoughts about light travel but not their imagination of "now."

Events in the ESC's "present" would be what a very-long-range radar would show if its beam, both going and returning, were almost infinitely fast (relative to the rest frame of the fabric of space, which I think is the rest frame of the cosmic microwave background radiation [Humphreys 2014, section 5; Humphreys, 2002, end note 28]). Such a beam would be a horizontal line in Figure 1. The "ESC super-speed radar beams" in Figure 4 will show that line in more detail as two almost-horizontal lines, the going and returning beams.

The right-hand vertical axis is *cosmic time*, the time a real clock 15 billion light-years away would tick off. Imagine a network of nonphysical ideal clocks, clocks that time dilation would not affect, spread throughout space and synchronized (by the ESC) with the real clock at 15 billion light-years. At the present time the cosmic clocks would have ticked off 15 billion years.

Real clocks that are closer to us than 15 billion light-years would be stopped part of the time, so they would have ticked less than 15 billion years. But when they are ticking, they would be synchronized with the cosmic clocks. That would include Earth's clocks, the *Earth time* shown on the left-hand axis. Today, Earth's clocks would have ticked off only about 6,000 years since Creation, but by the ESC those years would encompass all the cosmic events shown on the right. That is, we could imagine a network throughout space of ideal clocks that tick (and don't tick) in unison with Earth's clocks, being synchronized by the ESC. By this "Earth Standard Time," the universe is only about 6,000 years old. Relativity demands that to specify how old something is, we must specify which clocks we are using.

I have arranged this graph so that light rays with speed c are straight lines at 45° angles to the axes. Everything is to scale except the regions labeled "6000 yrs" and "4 days," which I had to make large enough to be seen. The horizontal axis is distance away from Earth, in light-years.

## **The Timeless Zone**

The triangular-shaded region in Figure 1 is what I call the timeless zone (Humphreys, 2008). In it, time is nearly at a standstill. Along the left vertical axis, I arbitrarily (to be specific for clarity) represent Earth's clocks as ticking off only one second during the billions of cosmic clock years Earth is in the timeless zone. This near timelessness is how I interpret the equations of Einstein's general relativity as applied to this situation, which is a relatively empty shell of mass, the "waters that are above the heavens" in Psalm 148:4. Though the shell of water (by now turned to ice particles and planet-sized balls of water covered with ice) is quite tenuous, its total mass has to be at least twenty times the total mass of the stars we can observe in the cosmos. This large mass has important results in general relativity, spelled out in my article (Humphreys, 2008). I arbitrarily (to be specific for clarity) place this shell at a distance of 15 billion light-years away from Earth, somewhat farther out than our telescopes can see.

The creation of the masses of the stars and galaxies causes (see Humphreys, 2008 for physics details) the timeless zone to come into existence early in the fourth ordinary-length day of Creation. It begins as a small spherical zone of darkness surrounding the earth. I call the surface of the sphere the *event horizon*, because it is similar to the event horizon of a black hole. The differences are (1) the gravitational forces within the timeless zone are relatively small, whereas inside the event horizon of a conventional black hole the forces get very large toward the center; and (2) time within the event horizon in this situation is nearly at a standstill, whereas in a conventional black hole, time stops only at the event horizon but resumes as one passes within it.

In this new variation of my scenario, the event horizon expands outward very rapidly, much faster than the speed of light, out to the shell of waters. The event horizon is a simply a boundary that marks where the fabric of space is at a certain critical level of gravitational potential (energy per unit mass). The horizon is not a material object, so it is not limited by the speed of light. The graph shows its expansion outward as a horizontal line, the bottom edge of the shaded triangle, just above the section labeled as the first four days of Creation. Just below that edge I show some newly created galaxies as bars of stars, whose mass brought the timeless zone into existence. The bars are spinning at creation, but they nearly stop spinning after the timeless zone engulfs them, because there is very little time for physical processes to take place in that zone. Later, after they emerge again from the timeless zone, they resume spinning, and after a few hundred million years of their time will turn into spiral-shaped galaxies.

## **How Starlight Got Here**

Shortly after the event horizon expands out to the shell of waters, it turns around and begins shrinking at roughly the speed of light. My 2008 paper explains how tension in the fabric of space would cause the timeless zone to shrink. A recent DVD (*Light Years?* No Problem! 2016) may help the nontechnical reader to understand this and other things in the 2008 paper, which was peerreviewed and technical. In this variation of the scenario, the tension would cause negligible expansion of the fabric of space. The redshifts of light from the galaxies would be caused by changes in gravitational potential, not expansion (Humphreys, 2008, eq. 21). The top of the shaded triangle shows the inward path of the event horizon. Notice that in most places its slope is close to 45° relative to the axes, indicating that its speed is close to the speed of light. As the event horizon shrinks, it uncovers galaxies (Figure 2). They resume emitting light, some of which follows the event horizon inward. Eventually the event horizon shrinks to zero radius, revealing the earth. The light that has been following the timeless zone inward then

reaches Earth. The graph shows the path of the light as a line, or light ray, pointing toward Earth at exactly 45°. Later light rays are parallel to but slightly above the first ray. The last light ray reaches Earth at the present, 6000 years after the first light ray to arrive.

To the right of the 6000-year light ray, galaxies exist, their present form unseen by us. Those galaxies continue to age. A galaxy 15 billion light-years away from us would have aged 15 billion years by the present time. It is that aging to which I think Isaiah 34:4 refers.

Notice that the top-left edge of the timeless zone curves upward a little, indicating that the event horizon slows down below the speed of light as it approaches Earth. Previous events in Creation week offer a simple physical cause for the slowdown, but that is a detail I hope to explain in another paper. Some



Figure 2. Light from emerging galaxies follows the shrinking spherical event horizon inward. For everything within the event horizon, including the earth at its center, time has almost stopped.



Figure 3. The "Antennae" galaxies are evidence for time dilation. Simulations show this structure would result from a collision of two normal galaxies lasting a few million years of their time, after which the images we see started on their way to us.



Figure 4. Lisle's cosmology seen using the Einstein Synchrony Convention (ESC) to display time. The "ESC super-speed radar beams" illustrate a way to give (in the location Earth would exist later) the time of creation of the second galaxy, about 0.75 billion years ago according to the ESC view of time. The Lisle cosmology says that God created Galaxies 1–4 in succession in a wave traveling inward at the speed of light. That way, the first light from each galaxy would arrive at Earth simultaneously with the others on the fourth day after the earth's creation.

of the earliest light rays from galaxies catch up with the event horizon and slow to a crawl within it. The upward curve makes a gap between the first light ray reaching Earth and the upper edge of the timeless zone to the right of the upward curve. That allows some cosmic time to elapse for the galaxies before the light we see from them started out toward us. A few hundred million years could elapse, giving differential rotation a chance to turn bar-shaped spinning galaxies into the spiral galaxies we now observe. There are a few other observations suggesting that millions of years of cosmic time elapsed for some astronomical objects before the first light we see from them had started on its journey toward Earth. An example is the "Antennae" galaxies (Figure 3), which simulations suggest are the result of the collision of two galaxies lasting several million years. It is evidence that time dilation occurred even before the images we see started toward us.

### "Aged Heavens" Scriptures Versus ASC

Figure 4 shows the Anisotropic Synchrony Convention (ASC) cosmology proposed by Jason Lisle (Newton, 2001; Lisle, 2010). For ease of general understanding, the figure depicts that cosmology using the Einstein Synchrony Convention (ESC), the conventional way to think of past, present, and future, which I described above in the second section. Lisle has said this is an acceptable way to present his view (Newton, 2001), though many of his supporters have not understood that. The "ESC super-speed radar beams" (see second section) shown are nearly horizontal, reflecting their almost infinite speed. This ESC view of the Lisle cosmology shows the creation of the galaxies as an inward-moving spherical wave, a thin shell of creation, starting billions of years ago and billions of light-years away. The shell would converge upon the earth





during the fourth ordinary-length day of creation about 6,000 years ago.

Lisle asserts that God used the ASC when He declared that He made the whole universe in six ordinary-length weekdays about 6,000 years ago. God would have dated (or "time-stamped") the entirety of each light ray by the time of its arrival upon Earth. In other words, if God were using the ASC, He would regard "now" or "the present," as being *all along* the sloped trajectory of light traveling to us in Figure 4.

Let us consider how the Lisle cosmology must deal with the *end* of the heavens. It has to have the stars in each galaxy being destroyed (falling and fading out) about 6,000 years after the creation of that galaxy. There would be a spherical wave of destruction converging upon the earth, reaching it during the end of this age. People at that time would observe all the stars disappearing at about the same time.

But that scenario doesn't allow any time dilation between the birth and death of each galaxy. The spiral galaxies would have to have been created in their currently observed shapes, and the "antennae" galaxies would have to have been created in the rather peculiar shape we now observe. None of the stars or galaxies seen at the end of the age would appear to have aged more than 6,000 years, contrary to the star-aging verses above. Thus, those verses are evidence against the ASC cosmology.

There is a way one could modify the Lisle cosmology to allow the stars to age. We could allow the galaxies on the "inbound wave of starfall" line to continue to exist (and continue to age) but somehow stop their light from reaching Earth when they are above that line. Then we could draw the horizontal dashed line, labeled "light from falling stars (modified theory)." That light ray would travel infinitely fast to Earth, allowing people at the end of the age to see the stars aged and falling. The main problem with this modified theory is that it has God using two implied definitions of "now," one all along the rays of slope 45° representing light reaching us at speed

*c*, the other all along the horizontal ray representing light reaching us at infinite speed. The second definition takes away the plausibility of the first. It would be more consistent to simply have the ESC and time dilation.

## **Discussion and Conclusion**

The Scriptures in the first two sections imply that the stars observed on Earth during the end of this age will be aged more than how we now see them. That supports some creation cosmologies and weighs against others. Figure 1 shows how time dilation with the ESC would allow accelerated aging of distant stars while much less time was elapsing on Earth. This implies that God used the ESC in Scriptures like this:

For in six days the LORD made the heavens and the earth. (Exodus 20:11)

Figure 5 shows the six days of Creation as being bounded by horizontal lines (ESC) extending throughout the universe. That is, the six days would elapse simultaneously (in the ESC sense) everywhere in the cosmos.

Figure 5 completely disagrees with the Lisle cosmology in Figure 4. The latter does not allow time dilation, so the Scriptures for aging in the heavens in the first two sections are evidence against it and against the ASC used to justify it. It appears that God's view of the past, present, and future is exactly how humans have thought of them since the beginning of the cosmos. God was using the Einstein Synchrony Convention (ESC) long before Einstein lent his name to this rather commonsense view of time.

#### References

Bauer, W., W.F. Arndt, F.W. Gingrich, and F.W. Danker. 1979. A Greek-English Lexicon of the New Testament and Other Early Christian Literature, 2<sup>nd</sup> edition, University of Chicago Press, Chicago, IL.
Humphreys, D.R. 1994. Starlight and Time. Master Books, Green Forest, AR. See pp. 55–57 for the "Timothy Test" of Scripture interpretation.

- Humphreys, D.R. 2002. Our galaxy is the centre of the universe, 'quantized' redshifts show. *Journal of Creation* 16(2): 95–104. Web version in color at: http:// creation.com/our-galaxy-is-the-centreof-the-universe-quantized-redshifts-show
- Humphreys, D.R. 2005. Evidence for a young world. *ICR Impact* No. 384, June. Archived at: http://www.icr.org/i/pdf/ imp/imp-384.pdf.
- Humphreys, D.R. 2008. New time dilation helps creation cosmology. *Journal of Creation* 22(3): 84–92. Archived at: https://creation.com/images/pdfs/tj/ j22\_3/j22\_3\_84–92.pdf.
- Humphreys, D.R. 2014. New view of gravity explains cosmic microwave background radiation. *Journal of Creation* 28(3): 106–114. Web version in color with typographic errors corrected at: http:// creation.com/new-view-of-gravity.
- Jones, W.B. 1988. Introduction to Optical Fiber Communications Systems. Harcourt Brace Jovanovich College Publishers, New York, NY.
- Kaku, M. 1994. *Hyperspace*. Oxford University Press, New York, NY.
- Light-Years? No Problem! Distant Starlight in a Young Universe. 2016. DVD. Creation Ministries International. Available at https://www.crsbooks.org/index.php/ light-years-no-problem.html.
- Lisle, J.P. 2010. Anisotropic synchrony convention—a solution to the distant starlight problem. Answers Research Journal 2:191–207, archived at: http:// answersingenesis.org/arj/v3/anisotropicsynchrony-convention.pdf (This article gives details about the ASC as additional support for the 2001 cosmology referenced below.)
- Newton, R. 2001. Distant starlight and Genesis: conventions of time measurement. *Journal of Creation* 15(1): 80–85. Archived at: http://creation.com/distantstarlight-and-genesis-conventions-oftime-measurement. ("Robert Newton" was the pen name Jason Lisle chose for

himself while he was still a grad student. This article is the clearest exposition of the Lisle cosmology, and it can stand alone.)

Pentecost, J.D. 1958. *Things to Come:* A *Study in Biblical Eschatology*. Zondervan Publishing House, Grand Rapids, MI.

## Appendix A: How People Could See the Stars Fall

Figure 6 shows a cross-section of the fabric of space in the vicinity of the earth. The vertical axis, labeled w, is the fourth spatial dimension (not time) that Scripture implies (Humphreys, 2014, section 3). The fabric is very thin in the w-direction, and so are masses such as the earth and stars, which are constrained to stay within the fabric but can move freely horizontally (in the x, y, or z directions) through it. I call the 4-dimensional volume above and below the fabric hyperspace (Humphreys, 2014, section 3), a term that has reentered physics in the last few decades (Kaku, 1994).

In my article (Humphreys, 2008, section 5 and end note 27), I discuss the optical properties of the fabric of space and hyperspace. The fabric must be exceedingly transparent in the horizontal direction, because light from very distant stars has traveled through it to us without much attenuation. I suggested that light can travel through hyperspace much faster than light traveling horizontally through the fabric at speed c. Then, under normal conditions, light emitted from stars within the fabric would suffer total internal reflection (see optics textbooks) and be prevented from leaving the fabric. Instead, it would be channeled horizontally through the fabric like light in a *single-mode* optical fiber (Jones, 1988). This reflection at the top and bottom edges of the fabric could be

also what constrains matter from leaving the fabric under normal conditions, or there could be some other constraint. Last, under these conditions, light and matter from hyperspace would similarly be prevented from entering the fabric.

However, there appear to be times when the above is not true. Scripture mentions a number of occasions<sup>1</sup> when the heavens have been or will be "opened," often clearly physically (not metaphorically or in a vision), with light and matter going to and from Earth through the openings. One passage that strongly implies such an opening is directly associated with the events in the heavens at the end of the age:

The sun became black as sackcloth *made* of hair, and the whole moon became like blood; and the stars of the sky fell to the earth ... And the sky was **split apart** like a scroll when it is rolled up ... and they said to the mountains and to the rocks, "Fall on us and **hide** us from the presence [lit. "face"] of Him who sits on the throne." (Revelation 6:12–16)

It appears that these people can see the face of God and are fearful because they see that He is seeing them. This and many other Scriptures (e.g., Psalm 102:19) imply that the third heaven (2 Corinthians 12:2–4), where the throne of God is, is in some unusual way above the earth, and not far from us. I suggest that it is within seeing distance in the fourth spatial direction, which we would perceive as upward. On this and the other "heavens opened" occasions, the normal barriers to light and matter moving in the *w*-direction, to and from hyperspace, seem to have been removed.

Removal of the barriers, even if only partially in places, would have four major consequences for the heavens:

Genesis 7:11; 2 Kings 7:2, 19; Psalm 78:23; Ezekiel 1:1; Malachi 3:10; Matthew 3:16; Mark 1:10; Luke 3:21; John 1:51; Acts 7:56; Revelation 19:11.



Figure 6. Cross section of the fabric of space, showing how falling stars could be seen almost immediately on Earth. The vertical direction, labeled w, is the fourth spatial dimension (not time) described in Humphreys (2014, section 3). The starlight travels very rapidly through hyperspace, entering the fabric of space just before it reaches Earth.

 Light from stars moving toward us within the fabric of space would tend to leak out into hyperspace, as light leaks out of an optical fiber when we damage its cladding (Jones, 1988, p. 112). That would attenuate light reaching us by the normal path from the heavenly bodies (sun, moon, and stars), making them darker, as several Scriptures say, such as this one referring to the end of this age:

> The sun and moon grow **dark**, And the stars **lose their brightness**. (Joel 3:15)

Consider the barriers constraining matter to movement only in the *x*, *y*, or *z* directions within the fabric of space. According to my explanation of gravity, the fabric of space is being enormously accelerated upward in the *w*-direction (Humphreys, 2014, section 4). If, in the regions where the stars are, God completely removes from the lower surface of the

fabric the constraint to *w*-motion, then the inertia of the stars would make them fall out of the fabric down into hyperspace, as Figure 6 shows.

3. The release of the great weight of the stars would let the fabric of space bounce upward and fall back downward. That would make great waves in the fabric of space that could be seen (via hyperspace) on earth while some stars are still in the fabric:

> But immediately after the tribulation of those days the sun will be darkened, and the moon will not give its light, and the stars will fall from the sky, and the powers of **the heavens** will be **shaken**. (Matthew 24:29)

Yet once more I will **shake** not only the earth, but also **the heaven**. (Hebrews 12:26)

This is apparently also the time when most of the fabric of space, except for

the region around the solar system, will be rolled up like a scroll or mantle (Isaiah 34:4; Hebrews 1:12; Revelation 6:14). Such rolling-up could also produce waves in the fabric of space.

4. The large speed of light in hyperspace would cause the atoms in the falling stars to emit greatly blueshifted light in their rest frame. But as seen from the fabric's frame, the falling stars would quickly accelerate to a speed close to the speed of light in hyperspace. That means velocity time dilation would produce a great redshift that would tend to compensate the emission blueshift, putting the light back into the visible wavelengths. Then the light would travel very fast through hyperspace until it reaches the fabric of space not far above the earth's surface. Because God has reduced the effectiveness of the reflecting barrier in that region, the light can enter the fabric of space, allowing people on Earth to see it.

I suggest that God has designed all these factors to show people great signs in the heavens at the end of the age. The stars darken while great waves in the heavens shake them. Then they fall, "as a fig tree casts its unripe figs when shaken by a great wind" (Revelation 6:13). After the starfall, there will be complete darkness in the stellar heavens beyond a darkened sun and a darkened, reddened moon. It will be a terrifying sight, causing "men [to be] fainting from fear," Christ said (Luke 21:26).

## Appendix B: Outline of the History of Interpretation

Some young-earth creationists are from theological traditions that interpret historical passages such as Genesis literally but prophetic passages nonliterally. Thus, they might be inclined to dismiss the Scriptures I offer as being merely poetic allegories that have nothing to do with physical reality. Many of these brethren are under the mistaken impression that the practice of reading prophecy straightforwardly started only recently in the nineteenth century. However, understanding prophecy literally was the normal view in rabbinical commentaries before the time of Christ, in the New Testament, and in commentaries by the early church fathers.

In his comprehensive book on the major systems of prophecy, *Things to Come*, Dwight Pentecost (1958) began by showing that the systems differ because of their differences in interpreting Bible prophecy. His second chapter is a well-documented study of the history of interpretation. I will merely touch upon some results of his study here.

First, Pentecost shows that the original method of interpretation of the Old Testament by Jewish teachers before the time of Christ was markedly literal. He states, "It must be concluded, in spite of all the fallacies of the Rabbinism of the Jews, that they followed a literal method of interpretation" (p. 17).

Next, he documents that Jesus Christ and the New Testament writers uniformly interpreted the Old Testament literally. The only seeming exception to that is in Galatians 4:24, where Paul makes an allegorical application of events recorded in Genesis chapters 17 and 18. It is clear, however, that Paul is basing his allegory on events he regards as historical. That is, he is interpreting the Genesis chapters literally.

Third, Pentecost shows that many of the church fathers before the fourth century interpreted the Bible literally. The main exception was Origen, who introduced the allegorical method of interpreting Scripture. At the beginning of the fifth century, Augustine was following Origen's allegorical method, and Augustine was profoundly influential in passing it on to the church of the Middle Ages. The Roman Catholic Church of today largely continues to use the method.

In the sixteenth century, the Reformers Luther and Calvin rejected the Roman church teaching on the gospel, but unfortunately, they continued to hold many of the other doctrines they had been taught in their youth, especially those of Augustine and the allegorical interpretation of prophetic Scriptures. Many of the mainline churches today that are tied closely to the Reformation still teach the allegorical interpretation of prophecy. Even before the nineteenth century, however, many conservative Protestant churches began returning to the original method of understanding Scripture, literal interpretation.