

**WHAT IS THE FUTURE OF THE SUN?:
An In-Depth Examination of Scientific and Biblical Realities**

The late 1800s saw the beginning of the modern evolutionary picture of how the sun works, what its past has been, and what its future will be. That picture is now extremely sophisticated, theoretical, and complex. It is complex enough to be beyond the understanding of the average lay person, so it is uncritically accepted by millions.

Nevertheless, this evolutionary picture of the sun is contradicted by scientific data (helioseismology and solar shrinkage data), and is at variance with the biblical picture of the sun's past and its future. **Future events in the sun will come as a catastrophic shock to millions enmeshed in the evolutionary claim that the sun has billions of years of peaceful operation ahead.** The expectation that the sun has a long future period of stability is fallacious, and is another symptom of the uniformitarian belief that "all things continue as they were from the beginning of the creation" (2 Peter 3:4).

I. HISTORY OF MODERN IDEAS ABOUT THE SUN

It is commonly stated that ancient peoples had no true idea of how the sun generates its energy. This may be true, but a biblical perspective on the abilities of early man allows for the possibility of ancient peoples who did indeed know how the sun works. If so, however, records of their knowledge has been lost. In modern times it was not until the 1800s that knowledge of physical laws and solar observations converged to allow models of solar energy generation to be developed.

In the 1870s the physicist von Helmholtz proposed that the sun generates most if not all of its energy by a process of slowly collapsing inward because of its own self-gravitation. This concept, called "gravitational collapse" or "gravitational contraction," was plausible, since the sun is a ball of gas, not a rigid body. **Gases falling inward would undergo a conversion of potential energy into kinetic energy, which would be released as the heat and light of the sun.**

Calculations in the 1800s indicated that the sun could generate energy for several tens of millions of years by gravitational collapse. The physicist Kelvin popularized this result, so this time scale of tens-of-millions-of-years is known as "Kelvin-Helmholtz time." **The sun could have begun contracting, possibly soon after the Creation Week, and could have generated all of its energy from gravitational collapse over the 6000-year biblical age of the universe.**

But by the 1870s the gradual geological evolution of Lyell dominated academic circles, and the earth was consequently thought to be at least hundreds of millions of years old. **To evolutionists, the Kelvin-Helmholtz time scale was too short, because in the evolutionary scenario the sun had to be at least as old as the earth, if not older.** There must be, it was claimed, some other longer-lived energy source powering the sun. Gravitational collapse was rejected as unsatisfactory to evolutionists almost as soon as it was proposed. It was rejected because of the threat it posed to the time scale of evolutionism, not for scientific reasons.

In fact, the first person to propose a longer-lived energy source was a son of Charles Darwin named George.

In 1903 he claimed that nuclear *fission*, a process discovered a few years before, occurs in the sun to give it a long lifetime matching the evolutionary chronology. But doubts about the possibility of solar fission arose immediately. The first attempt to devise a longer-lived energy source for the sun ended in failure. **Solar fission is now known not to be occurring.**

This did not stop evolutionists from continuing to devise for other energy generation methods to outlast gravitational collapse. In the 1920s astronomer Arthur S. Eddington proposed that the sun's energy comes from the annihilation of matter, yet another process now known not to occur. **Nevertheless, most popular ideas about the supposed internal properties of the sun and how it works stem from Eddington's evolutionary theorizing.** Indeed, as his starting point Eddington assumed for evolutionary reasons that the sun could not be generating energy by gravitational collapse, and the rest of Eddington's main ideas followed. These ideas are still accepted as truth today.¹

II. IS THERE NUCLEAR FUSION IN THE SUN?

In the 1930s nuclear fusion was first proposed as an energy source. If supplying all the sun's energy, fusion would allow the sun to operate for some 10 billion years according to the "standard solar model" (SSM), i.e., the conventional concept of how the sun works. **The SSM starts with Eddington's assumptions together with nuclear fusion as the only energy source.** Since the 1930s, evolutionists have assumed that there is no other mode of energy generation in the sun besides fusion. Evolution claims that the solar system is some 5 billion years old, so it is popular to believe that the sun has another 5 billion years left before it burns out.

Solar energy generation is an intensely studied topic, for every time evolutionists believe they have satisfactorily verified that the sun must have a very long age, new problems appear. **In the 1930s it became apparent the nuclear fusion reactions thought to power the sun must produce particles called "neutrinos."** These particles were thought to be so tiny that they could pass from the solar core to the earth in minutes. Evolutionists believed that neutrino detection would clinch the verification they sought for solar fusion, and neutrinos would therefore confirm the evolutionary chronology of the sun.

The first solar neutrino detectors were built in the 1960s at a cost of millions of dollars. **In 1968, researchers announced that the detected solar neutrinos were 75% less than expected.** In the 1980s and 1990s, detectors of greater sophistication were built at costs making the original versions seem cheap, but neutrino detection rates were no higher than about 1/3 to 1/2. Detector malfunction was ruled out, so **it was apparent the sun must be producing only a fraction of the neutrinos the SSM predicted.** If there were no way around this result, the conclusion would be that the sun at best is generating only a fraction of its energy by fusion, and the rest by some other process, presumably gravitational collapse.

Such a conclusion could not be allowed to stand, and a way was found around these results. **In the 1980s the idea was broached that solar neutrinos come in three "flavors" - electron, mu, and tau.** Further, the electron neutrinos produced in the sun were changing or "oscillating" on their

way to earth. Since the detectors of the time could sense only electron neutrinos, plans were laid to build a detector in Canada capable of finding the other two flavors. In 1999 the Canadian detector started looking for mu and tau neutrinos.

In June 2001, the announcement was made that enough mu and tau neutrinos had been detected to account for the neutrino shortfall. The conclusion was that some 40% of solar neutrinos make it to earth as electron neutrinos detectable by the old detectors, but the other 60% arrive to earth as mu or tau neutrinos. **Now the claim is being made that these "missing" neutrinos have been found, the SSM is therefore vindicated, and by implication we really know that the sun must be billions of years old.**

III. PROBLEMS FOR THE STANDARD SOLAR MODEL

Cheerful press releases have claimed that the 30-year-old "solar neutrino problem" (SNP) has been solved. **Even if the SSM were correct and the sun could potentially function for billions of years, this would not prove it has been doing so, or that it is older than biblical chronology indicates.**

But has the SNP really been solved? There are in fact some extremely vexing problems for the SSM indicating that it is not correct and that **present processes in the sun are radically different from what is commonly believed.**

(1) *Defects in the neutrino oscillation model.* A mathematical model (computer program) must be used to correlate the number of detected mu and tau neutrinos with the number of electron neutrinos supposedly produced in the sun. **This model has some extremely flexible parameters ("fudge factors"), the values of which are not known and which can be adjusted to make the detection rate fit the desired result.** Thus it cannot be said that we really know how many mu and tau neutrinos, if any, come from the sun.

(2) *Helioseismology.* The sun experiences gigantic vibrations ("sunquakes") as it releases energy. The study of these solar vibrations is "helioseismology." **The science of helioseismology indicates a different structure for the sun than assumed in the SSM.** In other words, helioseismology contradicts the SSM. This casts doubt on the SSM and implies that the SNP has not really been solved. Evolutionists claim that helioseismology fits the SSM, but are overlooking serious discrepancies.²

(3) *Solar shrinkage observations.* Gravitational collapse of the sun means that the sun is very slowly shrinking. Solar shrinkage has been observed consistently over several centuries.³ **Whether or not some fusion is occurring in the sun, contraction energy is therefore also powering the sun.**

Thus the energy of the sun will dissipate in much less than the future 5 billion years expected by evolutionists.

Modern publication of shrinkage data began around 1980. The typical evolutionary response has been to associate all shrinkage data with a study of two early researchers, Eddy and Boornazian. Eddy and Boornazian found a large shrinkage rate that turned out to be cyclical. Evolutionists have claimed that all shrinkage data are therefore cyclical, but this does not seem to be the case. **Most shrinkage data show long term decrease in the sun's diameter over many centuries.**

Even more, the shrinkage rate appears to *exceed* the rate of shrinkage needed to supply the sun's current energy output, called its "luminosity." **This means that the energy of contraction is accumulating in the sun.** This energy must be released at some future time. Such a release will likely be extremely catastrophic.⁴

(4) *Biblical prophecy.* **The biblical picture of the sun's future does not match the SSM.** In biblical prophecy, the sun will apparently undergo catastrophic changes in future centuries. The abject fear of those on earth in the Tribulation may be due partly to shocking violations of the SSM as the sun enters an unstable phase. Unfortunately, Christian accommodationists - day-agers, progressive creationists, and theistic evolutionists - reject this biblical picture as vehemently as unbelievers.

IV. THE SUN'S PAST ACCORDING TO THE BIBLE

Even science free of evolutionary philosophy cannot discern the past or the future. Only the Word of God can do that. **Yet man with his evolutionary philosophy is sure that he has indeed divined the sun's past and future.** This confidence is misplaced, as we will now see.

The Bible does not say very much about the sun's past, but what it does say is significant. We are told that the creation before the Fall was very good (Genesis 1:31). Among other things, this means that the creation was subject to no decay or death.⁵ Romans 8:22 says that the entire creation is now subject to decay, but originally the creation was free of this curse. **Thus even star death would have somehow been prevented in the initial state.** The creation in its sinless state is presented furthermore as a system that would last forever, with man being provided the tree of life to ensure a permanent life on earth (Genesis 3:22). **Since the stars were made to be time tellers, this means that the stars as originally designed must not have been intended to die.**

In contrast to an endless lifetime, gravitational contraction is a process that brings about the end of a star's life in a relatively short time scale on the order of 10^7 years at the most, and probably less. **It therefore appears that contraction in the sun (and presumably other stars) is a result of the curse, and not the original design for stars.** This conclusion is consistent with the reality that in many other ways, the creation is not working the way God originally made it. There is predation, killing, sickness, and death, all caused by sin - and, possibly, gravitational contraction of stars.

What would have been the original working of the sun? Whatever the process, it was one which would last essentially eternally. Perhaps the sun generated energy by a modified SSM. In other words, the sun may have been originally designed to operate by a process similar to the nuclear fusion embodied in the SSM. The working of the SSM is assumed to last for billions of years, which is virtually "eternal." But there would have been differences in nuclear activation energies and reaction rates resulting in the process being even more long-lasting. Further, we cannot rule out the

possibility of other processes that became impossible with the rise of the present entropy principle⁶ as a physical consequence of the curse on the ground (Genesis 3:17-18), which as mentioned above affected the entire creation.

With initiation of the Second Law, activation energies and reaction rates may have changed. Solar fusion would have become more difficult. With the drop in solar fusion rates, **the sun began to contract.** Based on the current (electron) neutrino deficiency of about 1/2, contraction may now be supplying about half the sun's luminosity. How long can this continue? The Kelvin-Helmholtz time for solar contraction is on the order of 10^7 years. Actually, even this does not seem to be true, for this is the time frame over which contraction would just supply the energy not supplied by fusion. **But the sun seems to be contracting even faster than this.**⁷

V. THE TRUE (BIBLICAL) FUTURE OF THE SUN

If the sun is contracting at a rate higher than needed to account for its luminosity, there must be heat accumulating in the sun. This means that the sun is not in what physicists call "thermal equilibrium." In the relatively near future, therefore, the sun's stable ("main sequence") lifetime can be expected to end, and **the sun will experience various cataclysmic decay events to release its excess heat.**

This is the future the Bible describes for the sun, and also for other stars, if one can read biblical statements about prophecy in a literal way. **A literal reading of prophecy for the future of the sun is consistent with an acceptance of the Genesis creation account as literal.** We would not expect the Bible to be literal at one end, but symbolic at the other.

Striking biblical predictions of the future behavior of the sun are in the book of Revelation. Revelation 8:12 says, "And the fourth angel sounded, and the third part of the sun was smitten, and the third part of the moon, and the third part of the stars; so as the third part of them was darkened, and the day shone not for a third part of it, and the night likewise."

The celestial phenomena in this verse are attributed to the action of an angel. This in no way, however, negates the fact that this verse is describing actual physical events.

Our secularist understanding of science in the West, prevalent since the rationalism of the 1700s, divorces God and His angels from interaction with physical phenomena. We tend to think of physical laws as "natural," happening apart from God, hence the phrase "natural law." In contrast, "miracles" are interventions of God in the natural world. **Such a dichotomy is a misconception of reality.**

True enough, miracles are caused by the intervention of God in the natural realm, *but so is natural law.* The Bible makes this clear in Colossians 1:17, where we are told that "by [Christ] all things consist," and Hebrews 1:3 where we are told that God the Son is "upholding all things by the word of his power." **Thus natural laws represent the intervention of God in his creation no less than miracles.** God is active in His creation everywhere, all the time, and natural law is simply the ordinary or usual manner which God has ordained to intervene in His creation. Paul appropriately preached to the

Athenians on Mars Hill, "For in him we live, and move, and have our being" (Acts 17:28), for his Greek hearers had views of natural law and evolutionism strikingly similar to ours.

The similarity of modern conceptions of natural law with ancient Greek (or Hellenistic) thought is no coincidence, for it was the open goal of the Renaissance thinkers of the 1300s onward to organize a "rebirth" of ancient Greek paganism. The Greek pantheon was dropped, but the main philosophical features were retained, and have come down to our own day via the lineage of Renaissance thinking, followed by the Enlightenment, rationalism, transcendentalism, romanticism, and now secular humanism.

As an inspired book, the Bible anticipates the falsehoods of modern times as well as the paganism of the past. In opposition to Greek (naturalistic) thought, **the Bible often emphasizes the operation of God and his angels in the creation, but at other times speaks in terms only of natural processes.** We see this contrast exemplified in biblical accounts of the Flood. The Genesis account of the Flood focuses on the physical phenomena and their effects on the earth and its population of living things.

Elsewhere in Scripture, the simultaneous intervention of God is revealed as He superintended every aspect of the Flood. In Psalm 29, for example, the voice of God is seven times said to cause terrestrial events. And what events are these? Even a casual reading of Psalm 29 shows that this psalm is describing a mighty storm. But verse 10 specifies that the storm being described is actually the Flood of Noah and its aftermath, since in this verse the word translated "flood" is the Hebrew word *mabbul*, elsewhere used in Scripture to refer to Noah's flood. Thus Psalm 29 provides a focus on divine intervention in the Flood not so obvious in Genesis.⁸

In short, divine or angelic intervention in an earthly event does not mean it is non-physical. The smiting of the sun and stars in Revelation 8:12 is a physical event, supernaturally superintended as are all events in the Creator's universe. In other words, "This phenomenon cannot be explained merely by clouds or haze in the sky, however, since it is specifically said to be caused by a smiting of the heavenly bodies in such a way as to reduce their light output by one-third."⁹

The phrase "the third part" in Revelation 8:12 can be (and probably should be) translated "a third."¹⁰ Thus the sun's heat, and also that of the stars generally, is reduced by 1/3. Taken literally, this prediction for the sun applies to the stars also, indicating that **stellar evolution understands the working of other stars no better than it does the sun.** The light of the moon is reduced by the same proportion of 1/3 because the moon shines by reflected sunlight.

This same event is evidently predicted in the Old Testament. Joel 2:31 states, "The sun shall be turned into darkness, and the moon into blood [i.e., it will appear to be red], before the great and the terrible day of the Lord come."

The moon's bloody appearance may be connected with solar instability: "Consider what might happen . . . as a result of the sun's generating many times the amount of energy

now escaping from it. What would occur if the sun were to 'blow its stack'? Might material from the sun be hurled into space in such a way as to make the remaining core appear darker [and] the moon glow red? . . ."¹¹

VI. HAVE OTHER STARS FORESHADOWED THE (TRUE) FUTURE OF THE SUN?

Over several decades, the star FG Sagittae, *at one time thought to be similar to the sun*, progressed through a range of spectral classes from blue to yellow.¹² FG Sagittae is surrounded by a spherical shell of gas (a so-called "planetary nebula") that formed possibly a few thousand years ago in a violent explosion. **Does the fate of this erstwhile sun-like star foreshadow the fate of the sun?**

Such behavior would be totally consistent with the fact that the entire creation is now "groaning and travailing" under the curse of sin and is not working the way it was originally designed (Romans 8:22). Even the earth itself is said to be "kept in store" (2 Peter 3:7), suggesting there are processes of degradation now progressing in the earth of which we are yet ignorant, but that will one day lead to its ultimate dissolution.

The Genesis Flood provides a parallel example of future dissolution in the earth predicted long before it occurred.

In the case of the Flood the prediction was 120 years ahead of its fulfillment (Genesis 6:3), but Peter's prophecy of the earth's final dissolution has been in force now for almost 2000 years. In proportion with the shorter prediction time, the Flood devastation was not nearly as severe as that of the last day predicted in 2 Peter 3:10, when "the elements shall melt with fervent heat." The apostle Peter himself describes the parallel between these two events in verses 3-10 of 2 Peter 3.¹³

Further, a staggering implication of Revelation 8:12 is that **all stars in the heavens, not just the sun, are on the same timetable of degradation that will climax at this time in history.** For stars other than the sun, this verse could perhaps be interpreted to indicate that their light decreases by an average of 1/3, but nevertheless, **the universal scope of stellar change here implied is at odds with stellar evolution which predicts that stars have vastly different stable lifetimes ("main sequence" lifetimes).** The biblical future of the sun and other stars is radically different from the future according to stellar evolution. **If the Bible is true, stellar evolution cannot be occurring.**

The stellar dimming described in Revelation 8:12 is temporary, lasting for a only relatively short time.

A time frame of decades or centuries is ruled out given the time frame of the book of Revelation. Later on the sun becomes unusually hot, as described in Revelation 16:8: "And the fourth angel poured out his vial upon the sun; and power was given unto him to scorch men with fire." As with Revelation 8:12, this verse is best understood as describing a physical event that is supernaturally superintended.

Zechariah 14:6-7 seems to describe this same event as a time in which the night sky will be indistinguishable from the light of day: "And it shall come to pass in that day,

that the night shall not be clear, nor dark: but it shall be one day which shall be known to the Lord, not day, nor night: but it shall come to pass, that at evening time it shall be light."

Isaiah 30:26 also seems to describe this event, with an added specification as to how much brighter the sun will be: "Moreover the light of the moon shall be as the light of the sun, and the light of the sun shall be sevenfold, as the light of seven days, in the day that the Lord bindeth up the breach of his people, and healeth the stroke of their wound." The earth will receive as much light (and heat) as would normally be contained in the radiation "of seven days."

Because of negative feedback mechanisms on the earth that tend to damp out changes in the earth's temperature, the seven-fold increase in the sun's luminosity will not translate into a proportional increase in the earth's absolute temperature. Nonetheless, Revelation 16:9 says that "men were scorched with great heat, and blasphemed the name of God," showing that the resulting temperature at the earth's surface will be uncomfortable in the extreme, though not lethal.

With these end-time events happening in the sun and stars, we have the culmination of one of the purposes for which the heavenly bodies were created. **Genesis 1:14 tells us that the celestial bodies were created to be "signs."** A "sign" in Scripture signifies an indication or proof of God's power. Thus the celestial bodies here are showing God's power, which is a fearful thing to those who have rejected Christ. Jesus prophesied in Luke 21:25-26: "There shall be signs in the sun and in the moon, and in the stars . . . men's hearts failing them for fear, and for looking after those things which are coming on the earth: for the powers of heaven shall be shaken."

This is the scenario the SSM predicts for the sun some 5 billion years in the future. Yet it is doubtful that there is a Bible believer anywhere who would claim that these prophetic events are so remote. In fact, most Christians would probably agree that Bible prophecy will be culminated within the next thousand years or so, and probably less. **The biblical view of the sun's future seems far too short to reconcile with the SSM which predicts 5 billion more years of stable hydrogen burning.** On the other hand, the biblical scenario is very compatible with the possibility that the sun is undergoing contraction with energy accumulation.

Clearly, the biblical picture of the sun's future does not match the SSM. On the other hand, it does appear that solar shrinkage has been reasonably verified by actual observations. If this be so, then all sophisticated patching of the SSM must be seen not as an approach to the truth, but as a further departure from it.

VII. THE CULTURAL PARADIGM SHIFT

The SSM is beset by difficulties so grave as to disprove it altogether. Indeed, the evolutionary chronology of the sun has been continuously accosted by problems ever since Helmholtz proposed solar gravitational contraction. Yet none of these difficulties has caused the evolutionary community to doubt whether their chronology is true. Instead, **every difficulty has**

been met by additional speculation, resulting in an SSM that is dependent on theoretical neutrino oscillations, while being at variance with helioseismology, solar shrinkage data, and biblical prophecy.

The Bible and history show the tendency of "science" to move farther from the truth as time passes, not closer. Because of man's fallen nature, there is an in-built tendency to follow not truth but error. **This results in a shift of the world-view of a culture - a "paradigm shift" – away from God.** ("Paradigm" is pronounced PAIR-a-dime.)

In the last millennium, science was arguably closest to truth soon after the Reformation, and has been moving farther away in every area since then.¹⁴ This process began with philosophies such as evolution being taught for the first time since antiquity by the rationalists of the 1700s. Popular acceptance of evolutionism followed in the 1800s, and now evolutionary thought has permeated virtually every discipline. Now adherence is demanded to evolutionary tenets more than to scientific accuracy.

In the conventional view, however, man is generally improving. **Applied to science, this belief means that new scientific claims are supposed to be generally an improvement on old ones.** Older ideas were "primitive," and modern man has an innate tendency to move toward truth, not error. Every creationist with a biblical view of history should aggressively challenge this position, for **the biblical and historical reality is that cultures do not continuously improve, not even scientifically.**¹⁵ Instead, cultures shift through a series of paradigms, starting from a condition of relatively high awareness of God, to a condition in which human philosophies replace God altogether. **Romans chapters 1 and 2 document this phenomenon in a general way for all ancient cultures.** Modern culture is no different, because human nature has not really changed since antiquity.

This paradigm shift can be documented for virtually all long-lived cultures of the past for which we have sufficient historical data. Cultures such as the Sumerian, the Egyptian, the Greek, the Roman, the east Indian, the Chinese, the Olmec and Maya, the Aztec, the Inca - all show relatively innocuous beginnings, with a descent into idolatry and various forms of human sacrifice, including baby-killing.¹⁶

Christians generally are aware of aspects of the current paradigm shift, at least in politics, the educational system, and the media. **But a view that perceives a shift in America only since the 1960s or so is too limited.** The seeds of the shift were planted by Renaissance thinkers, worked over in the Enlightenment, and blossomed in the late 1700s. **The French revolution of 1789 was the first significant public manifestation of rationalist philosophy.** The chaos of the French revolution came to an end, but its philosophy was gradually insinuated into the nations of Europe, then America, and finally the European colonies and portions of the third world such as China and India once controlled from Europe.¹⁷

VII. THE PARADIGM SHIFT IN SCIENCE

The seemingly endless evolutionary theorizing done to save the SSM is a symptom of the paradigm shift in our culture.

This paradigm shift is a movement away from God. Then why is it that Christian apologists and others who know of the shift in politics, education and the media seem to view scientific theorizing as immune to this shift? There are two possible reasons.

One reason relates to modern technological development. **Technology is an extension of basic scientific discovery, an application of science, but it is not science.** Technology can continue to grow even while science itself is shifting from observing how the creation behaves *to theorizing about how nature ought to behave.* Joseph Needham showed that science in China, vigorous centuries ago, stagnated because of China's adherence to fatalistic philosophies.¹⁸ Moving to the present day, it has been argued that continued allegiance of Western science to theories such as the Big Bang is a symptom of scientific decline.¹⁹

Ancient Chinese fatalism and modern Big Bang theorizing are alike in presuming to say *how the universe ought to behave* rather than allowing observations of the creation to speak for themselves.²⁰ **However, many people, even scientists, confuse technological growth with science.** Technology is growing,²¹ so they erroneously assume that science itself is poised for centuries of further development, as in our more biblically-oriented past. Symptoms of the paradigm shift in science elude these people.

A second reason appears to be that many Christians have adopted Carl Sagan's dogma that science is not like other human endeavors, but is uniquely objective and self-correcting. Sagan used to say: "If you look at the collective enterprise of science, you see that it has elegant, self-correcting machinery built into it in a fundamental way, which makes it different from everything else. . . . Science demonstrably works better than anything else."²² **Yet a more accurate perspective would perceive a linkage between excessive scientific theorizing and the spiritual state of our culture.** Theorizing that constantly points away from God is not a sign of a spiritually healthy culture.

Before the rise of modern evolution in the 1800s, scientists tended to embrace observations of nature as testimonies of God as Designer of the cosmos.²³ With the rise of evolution, scientific observation did not suddenly cease, but there arose a new tendency to devise theories that would force all observations into an evolutionary paradigm. Armed with the misconception that science is a uniquely objective activity, however, many Christians are blind to the fact that **science is actually subjectively guided by the spiritual paradigm of a culture.** Therefore the myth persists that the spiritual decline of a culture has no influence on its scientific theorizing, and **theories that should be discarded are instead crowned as new revelations of truth.**

There has been an evolutionary "hardening of the heart" analogous to the hardening of pharaoh's heart in ancient Egypt (Exodus 7:22, 8:15, 32). **The evolutionary community is not moving closer to the Bible, but farther from it. Sadly, Christians who adopt evolutionary ideas are moving in the same direction.** Revelation 16:9 indicates that such an

assessment is not overly pessimistic. This verse describes the response of mankind to the catastrophic disproof of stellar evolution occurring in the end times: "And men . . . blasphemed the name of God, which hath power over these plagues; and they repented not to give him glory."

Foreshadowings of this prophecy are already occurring. One does not see, for example, the program *Nature* on PBS glorifying God. Typically, an intricate and beautiful facet of the natural world is described in such a way as to generate spontaneous praise to God in the heart of a Christian, followed by the program formally giving credit to eons of evolution. God is not yet blasphemed explicitly, but the persistent refusal to glorify God for His works is the first tragic step toward that end.

IX. CONCLUSION: WHAT IS HAPPENING IN THE SUN?

Solar neutrino detection rates on earth indicate that hydrogen fusion is supplying perhaps no more than about 1/2 of the sun's luminosity. **Fusion reactions seem to be occurring at suppressed rates**, and certainly do not appear to supply all the sun's energy as is commonly claimed.²⁴

The balance of solar luminosity is supplied by gravitational contraction. **Solar contraction appears to be occurring at a rate exceeding a Kelvin-Helmholtz rate.** This implies that the sun is not in either hydrostatic equilibrium or in thermal equilibrium. The resulting internal thermal accumulation would be expected to lead to extreme solar instability in the relatively near future. The biblical record predicts that such events will occur in the sun, as well as in other stars. Therefore, the sun (and presumably other stars) are moving along the astronomical "main sequence" at a rate greatly exceeding that predicted by the SSM and stellar evolution in general.

Gravitational contraction is seen as a process of degradation, presumably initiated by internal stellar changes in connection with the curse on the ground. In the initial perfect state of the creation, gravitational contraction may have been absent, with the sun and other stars generating energy over extremely long (essentially eternal) time frames by processes somewhat analogous to stellar nucleosynthesis as it is presumed to be occurring today. However, such processes could not have been identical to the presumed nucleosynthesis of the present, because the original creation was not subject to decay, and conventional nucleosynthesis leads to star death after millions or billions of years.

Notes

1 Eddington's assumptions would be considered rather technical outside of an astronomy course. His main ideas were as follows: (1) the sun is in hydrostatic equilibrium (which cannot be true if the sun is contracting, hence his need to reject gravitational collapse to allow for this assumption); (2) the solar core must be extremely hot to preserve the hydrostatic equilibrium and prevent collapse (he claimed the core temperature is 40×10^6 °C, but current models use 15×10^6 °C); (3) to preserve the high core temperature, there can be no convection out of the core (hence follows the popular idea that it takes millions of years for a photon to rise from the center of the sun to the surface); (4) the inner layers of the sun must therefore have a high "opacity."

These ideas are necessary to preserve a long solar chronology, but they have been thrown into doubt since Eddington's time. Yet the evolutionary

community continues to defend them as true. See J. Henry, "The Evolutionary Basis of Eddington's Solar Modelling," *Creation Research Society Quarterly*, Vol. 40 no. 1, March 2004, pp. 244-256; J. Henry, "What Do Solar Neutrinos Reveal about the Sun?," <creationconcepts.org>, 2004.

2 J. Henry, "Helioseismology: Implications for the Standard Solar Model," *Creation Research Society Quarterly*, Vol. 40 no. 1, June 2003, pp. 234-240; J. Henry, "Do Solar Sound Speeds Confirm the Standard Solar Model?," *Creation Research Society Quarterly*, Vol. 41 no. 2, September 2004, pp. 168-170.

3 J. Henry, "Is There a Secular Trend in Solar Diameter?," <creationconcepts.org>, 2004.

4 Table 1 below summarizes secular solar contraction data spanning the last 400 years. Contraction rates are in arc-sec per century. The column headed "Data Type" indicates the type of data used; MT means Mercury transit of the sun, SE means solar eclipse, and ST means solar transit. The average secular contraction rate in the diameter is v_{obs} ; $v_{\text{obs}}/v_{\text{theory}}$ is the ratio of the average secular contraction rate compared to the predicted Helmholtz diameter contraction rate of 0.01 arc-sec per century. Error ranges are also listed according to information provided in the individual reports; v_{max} and v_{min} are respectively the upper and lower end of the error range.

The average minimum contraction rate v_{min} is ≤ 0.04 arc-sec per century, several times the predicted Helmholtz contraction rate. **Thus the sun appears to be contracting faster than the Helmholtz rate**, and gravitational contraction appears to be supplying more than enough energy to maintain the sun at its present luminosity, even without fusion. **It appears that some of the energy generated by gravitational contraction must be accumulating in the sun's interior.**

Possibly the contraction rate of the sun may not be constant. "Convective overshooting" may be a plausible mechanism for the "material mixing" in the sun revealed by helioseismology (D.O. Gough et al., "The Seismic Structure of the Sun," *Science*, Vol. 272 no. 5266, May 31, 1996, p. 1299). Such a mechanism if occurring deeply enough could effect the occurrence of fusion reactions in the core. There is in fact an apparent 21.3 day periodicity in solar neutrino flux that could be caused by variable fusion reaction rates..

As solar physicist John Eddy has observed, "I don't think that such irregularity is a mark of health. I think it's the mark of a shaky, rickety machine" (T.E. Bell, "The Shaky Machine," *Astronomy*, Vol. 6, no. 2, February, 1978, pp. 16-17). Eddy's assessment of the sun's behavior is consistent with the fact that the sun, and all of creation is "groaning" and is not working in the way it was originally designed.

5 J. Henry, "Did Death Occur Before the Fall?: A Further Critique of the Progressive Creationism of Hugh Ross," *Creation Research Society Quarterly*, Vol. 43 no. 3, December 2006, pp. 161-165.

6 All matter at a temperature above absolute zero has some entropy. This fact is called the Third Law of Thermodynamics. **Thus there was entropy before the curse on the ground (Genesis 3:17-18).** The pre-Fall presence of entropy means, for example, that digestion occurred and biological systems produced wastes with an accompanying entropy increase. But somehow these entropy increases did not result in the eventual death of biological systems.

There were apparently also compensatory processes in which entropy decreased, so as to nullify the entropy increases of ordinary metabolism. **Compensatory processes presumably operated in the non-biological realm as well.** These compensations ceased when God cursed the ground, and now entropy increases in every natural (i.e., spontaneous, "irreversible") process.

The miracle of the burning bush (Exodus 3:1-3) provides a glimpse of the manner in which God had designed the creation to operate before the Curse. The bush burned, displaying fire and flame with its familiar entropy increase, but a compensating process prevented the bush from being consumed.

The pre-Curse entropy principle therefore was that entropic and negentropic processes spontaneously occurred, resulting in a zero net entropy increase for the cosmos over time. **The present post-Curse entropy principle is stated in the Second Law of Thermodynamics, that the entropy of the cosmos increases in all natural processes.**

The Second Law did not exist in its present form before the Curse. Discussions of pre-Curse conditions often confuse the existence of entropy with the occurrence of entropy *increases* and the Second Law, claiming that because there was entropy before the Curse therefore the Second Law must also have existed. But if this were true, there would have been death then.

7 In Table 1, the average v_{obs} is 0.17 arc-sec per century, corresponding to an average $v_{\text{obs}}/v_{\text{theory}} \approx 20$. **This implies that the sun may be undergoing gravitational contraction at a rate exceeding the Helmholtz prediction by a factor on the order of 10.** Rather than the 20 million year maximum solar lifetime of Kelvin-Helmholtz contraction, **the sun would have a maximum age of the order of 10^6 years.** This constraint on the sun's lifetime falsifies the common conception of a 10 billion year lifetime for the sun. In this sense, gravitational contraction may be said to "date" the sun, though such results do not bring the sun's age within the biblical chronology. But a sun dated on the order of 10^6 years is young relative to conventional chronology.

Further, a contraction rate exceeding that required for thermal equilibrium suggests a primordial (pre-Curse) equilibrium that was destabilized in connection with the curse on the ground. Although the sun appears to be superficially stable, if it is contracting on the order of 10 times faster than the Helmholtz rate, it could enter an unstable phase in the relatively near future due to sudden release of accumulated energy. However, the actual contraction rate is sufficiently imprecise that it is not possible to estimate a date for this series of events.

The average maximum contraction rate v_{max} is 0.30 arc-sec per century. It can be inferred that values of the secular contraction rate exceeding this value are unreliable, or contain unrecognized cyclic components.

8 H.M. Morris, *Sampling the Psalms*, Creation-Life, 1978, pp. 38-43.

9 H.M. Morris, *The Revelation Record*, Creation-Life, 1983, p. 150.

10 *ibid.*

11 H. Hinderliter, "Short-Term Changes in the Sun," in *Design and Origins in Astronomy* (ed. George Mulfinger), Creation Research Society, 1983, p. 131.

12 K. Crosswell, "Life and Times of a Chameleon Star," *New Scientist*, Vol. 131, September 14, 1991, pp. 36-38.

13 H.M. Morris, *The Genesis Record*, Master Books, 1976, pp. 170-172.

14 J. Henry, "The Rise of the New Scientific Priesthood," <creationconcepts.org>, 2006.

15 J. Henry, "Ancient Technology and the Progressivist Fallacy," <creationconcepts.org>, 2006.

16 P. deParrie and M. Pride, *Ancient Empires of the New Age*, Crossway, 1989, pp. 87-117; H.M. Morris, *The Long War Against God*, Baker, 1989, pp. 75-91, 137-143.

17 C. Quigley, *Tragedy and Hope: A History of the World in Our Time*, Macmillan, 1966, pp. 7-23; S. Blumenfeld, *Is Public Education Necessary?*, Paradigm, 1981, pp. 27-47.

18 A. Fisher, "The Roots of Science in Ancient China," *Mosaic*, Vol. 13 no. 2, March/April, 1982, pp. 9-15.

19 E.J. Lerner, *The Big Bang Never Happened*, Random House, 1991, pp. 406-413.

20 Romans 1:20 states that observations of the creation unconstrained by human theorizing testify of God's existence, His godhead, and His power to create.

21 Technological development is relatively immune to this paradigm shift, because technology is based on what actually works, rather than philosophical speculations about the way nature "ought" to be. **This difference demonstrates that technology is not the same as science, although the two are closely related.** This fact also explains why technological development can continue long after science itself becomes enmeshed in a cultural attempt to verify false philosophies. As science is increasingly co-opted into justifying false philosophies, a divergence appears between science and technology in how each is carried out. **Science is done increasingly with a philosophical agenda, but technology is done with a decreasing regard for that agenda.**

Petroleum prospecting provides an example of the emerging divergence between science and technology. Petroleum prospecting is carried out with little regard for evolutionary speculations about the formation of oil deposits. It is based on "what works." Muskat, for instance, discusses petroleum prospecting with no mention of the evolutionary principles which would supposedly inform one's understanding of petroleum formation and prospecting (M. Muskat, *Physical Principles of Oil Production*, International Human Resources Development Corporation, 1981, pp. 114-176). This is in complete contradiction to the treatment of the identical topic in a typical geology text (H. Levin, *Contemporary Physical Geology*, Saunders, 1986, pp. 492-494). However, when the same geology text discusses actual prospecting, it becomes just as factual as Muskat and all evolutionary theorizing disappears (*ibid.*, pp. 494-496).

The divergence has become more pronounced with the passing of time. Petroleum formations had traditionally been conceived as occurring under nearly anhydrous conditions, as dictated by evolutionary theory, with the result that the formations predicted to harbor petroleum turned up "dry" after drilling about 4/5 of the time. In the mid-1980's, Exxon conceived the idea of simulating oil formation with water present with the result that the formations predicted to be petroleum sources were assessed more accurately (E. Pennisi, "Water, Water Everywhere: Surreptitiously Converting Dead Matter into Coal and Oil," *Science News*, Vol. 143 no. 8, February 20, 1993, p. 124). Due to this change, and some other technological improvements, only 1/5 of attempted wells are now "dry."

Interestingly, Exxon's new simulation of petroleum formation in water is suggestive of Flood conditions, though that was not Exxon's reason for invoking this new condition. Exxon was merely trying a new model parameter they thought might have been overlooked. There was no conscious rejection of evolutionary theory in Exxon's work. Nevertheless, their pragmatic approach showed an implicit disregard for evolutionary modeling.

22 S. Budiansky, "Keeper of the Flame," *U.S. News & World Report*, Vol. 171 no. 78, March 18, 1996, p. 78.

23 J. Henry, "Notable Scientists of the Past," <creationconcepts.org>, 2003.

24 Deuterium formation occurs, but probably not helium production or most of the other reactions assumed in the SSM. See J. Henry, "What Do Solar Neutrinos Reveal about the Sun?," <creationconcepts.org>, 2004.

Table I. Solar Secular Contraction Data

Investigator(s)	Data Type	v_{obs}	$v_{\text{obs}}/v_{\text{theory}} \times 10^{-1}$	Error Range	
				v_{max}	v_{min}
Dunham et al.	SE	0.26	3	0.41	0.11
Gilliland	MT, ST	0.2	2		
Morrison and Ward	MT	0.14	1	0.22	0.06
Parkinson et al.; Stephenson	MT, SE	0.15	2	0.29	0.02
Parkinson ¹		< 0.16	< 2		
Shapiro ²	MT	0.11	1	0.25	+ 0.03
Sofia et al. (1979)	ST	≤ 0.46	≤ 5		
Sofia et al. (1983 and 1979) ³		≤ 0.31	≤ 3		
Averages		0.17 ⁴	2	0.30 ⁵	0.04

Notes for Table 1:

- Note 1. Parkinson (1983, p. 518) showed a reduced upper limit for secular contraction, here taken to be less than the 0.16 arc-sec per century rate reported by Stephenson (1982, p. 172).
- Note 2. All data uniformly weighted (Shapiro 1980, p. 52).
- Note 3. Result for modern data (c. 1950-1973) not unfavorably weighted (Shapiro 1980, p. 52).
- Note 4. Time-weighted secular contraction average, using a zero rate for 1925-1979, and 0.31 arc-sec per century for 1850-1937.
- Note 5. A 0.03 arc-sec per century increase in solar diameter.
- Note 6. Averages for v_{obs} and $v_{\text{obs}}/v_{\text{theory}}$ were computed using the four entries for which error ranges were available, plus the Gilliland entries.
- Note 7. Averages for v_{max} and v_{min} were computed using only the four entries for which error ranges were available.

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