

10 *Shrinking Sun?*

The Alleged Shrinking/Collapsing Sun

Before anyone knew about nuclear reaction, scientists were puzzled how the sun had so much energy output. In 1871, von Helmholtz showed that the sun burned the equivalent of 1500 pounds of coal every hour on every square foot of the sun's surface. Hartmann comments: "No ordinary chemical reactions can produce energy at this rate!" Thus, Helmholtz realized, the Sun is not 'burning in the normal sense.'¹

Hence, Helmholtz suggested that gravitational collapse within the sun could produce such a burning reaction. Ackerman says, however, that if the sun "produced its energy by gravitational collapse, the sun could last no longer than a few million years. . . ." (*Id.* at 56.)

Ackerman points out that Lord Kelvin (1824-1907) — known as the "champion of a young earth" to another generation — debated Thomas Huxley around the turn of the century. Kelvin made use of Helmholtz' speculation. (No observations confirmed Helmholtz theory.) Ackerman says that

Lord Kelvin tore the evolutionist position to shreds with simple and straightforward physical arguments that the earth and solar system were not old enough for life to have arisen by Darwin's proposed evolutionary process. Among Lord Kelvin's arguments on the age issue was ***the time factor for the sun's sur-***

1. Hartmann, *Astronomy: The Cosmic Journey* (Belmont, CA: 1991) at 318.

vival based upon Helmholtz's accepted model of gravitational collapse. Lord Kelvin had the theory of evolution on the ropes and had seemingly dealt the knockout blow. (*Id.* at 56.)

Ackerman, however, does not tell his readers what date Kelvin deduced for the age of the earth in this debate. (Huxley was honest enough to accept it at that time.) Is it the 10,000 year old earth that the moon dust, helium, lack of meteorites, etc., supposedly provides?² No!

In 1866, Kelvin published a paper that assigned an age of the earth of about 100 million years. Later he whittled this figure down to 20 million years. His calculations were based on the assumption that the earth started as a molten body (true), and was steadily losing heat (obeying the second law of thermodynamics discovered by Kelvin), and mine-based readings which showed the current rate of heat loss of the Earth's crust. Huxley accepted these dates, showing he was a man of science. Kelvin then argued that evolution had too short a time to succeed in 20-100 million years.³ At that time, in fact, the process of genetic change was so little understood, neither Kelvin nor Huxley could have known how much time was needed.

It turns out that Kelvin's dating of earth was correct, subject to the discovery in 1903 of atomic radiation that replenishes to a certain extent the heat of the earth's crust. "The discovery of radioactivity not only destroyed Kelvin's argument," but it also, as Gould points out, "provided the very clock that could measure the earth's age and proclaim it

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2. Repeatedly Ackerman endorses the age of the earth as "thousands of years, not millions or billions." (*Id.* at 45) In this same chapter, referring to the star clusters of Trapezium, Ackerman says it "raises the question of whether the creation itself should be considered as older than 10,000 years." (*Id.* at 60) Clearly, Ackerman says the universe dates around 10,000 years and not in the millions or billions of years.
 3. Richard Milner, *The Encyclopedia of Evolution* (N.Y.: Henry Holt & Co., 1990) at 249-50.

ancient after all [*i.e.*, 4.5 billion years.]”⁴ This led to a new theory on what was causing the sun’s energy. Ackerman notes:

The discovery of atomic radiation changed the whole picture. Evolutionists suddenly took new courage as the phenomenon of atomic radiation seemed to provide the necessary answer to Kelvin's challenge. With regard to the question of why the sun shines, ***the gravitational-collapse theory became unfashionable***, and in the 1930s Hans Beth introduced the currently accepted view that thermonuclear fusion in the sun’s core is the source of its energy. (*Id.* at 56.)

Although Ackerman treats scientific theory as routinely subject to the test of “fashion” rather than empirical observation and inference, it was eventually proven that the sun does burn by nuclear fusion. How? It emits enormous amounts of neutrinos — the by-product of nuclear fusion.

Ackerman tries to disprove this claim in a weird manner. He acknowledges that neutrinos are the one means “to verify scientifically” the sun burns by nuclear fusion, but it is “very expensive.” He points out that in 1976 a Princeton astronomer named John Bahcall wrote a paper on the evidence from his study of neutrinos.⁵ Ackerman quotes Bahcall as pointing out that “only one” piece of evidence “has the ability to penetrate from the center of the sun to the surface and escape into space” to prove thermonuclear reactions are going on: “the neutrino.” Ackerman does not dispute that fact. (*Id.*, at 57-58.)

4. *Id.*, at 250.

5. The cite is John N. Bahcall and Raymond Davis, Jr. "Solar Neutrinos: A Scientific Puzzle," *Science* 191 (1976) at 264-67.

Ackerman then says the results of the “neutrino-capture experiments are very exciting, for they indicate that the thermonuclear-fusion theory of solar radiation may be entirely wrong.” What points to that amazing conclusion?

Ackerman cites an article from the *Whichita Eagle and Beacon* (March 23, 1980) at page 6B entitled “The Sun is Shrinking” where Kevin McKean discusses the “missing neutrinos” problem. In the article, it says “in nearly a decade of operation the detector has found only one-third the expected number of neutrinos. . . .” (*Id.* at 58.)

Doesn’t this prove the sun burns at least *partly* by thermonuclear reaction? McKean did not make that conclusion, but Ackerman will concede this important fact. Since we were then finding plenty of neutrinos — the by-product of thermonuclear reactions, we knew thermonuclear reactions are occurring. There is no possibility that thermonuclear-fusion was “entirely wrong” as Ackerman suggests. The only problem was that less neutrinos were found than expected. Ackerman then picks up from Henry Morris, the founding leader of ICR, this misguided idea that the so-called “missing neutrinos” problem proved that there is no thermonuclear processes occurring in the sun.⁶ Neither Ackerman nor Morris logically interpret evidence. For this is a non-sequitur.

Does Ackerman ever explain the latest theories at the time of his writing which were offered to explain this deficiency? No. He feels free instead to claim the thermonuclear theory was disproved, although the exact opposite is true. Ackerman never cites any authority for the following incredible conclusion:

6. Morris in *Scientific Creationism* (1985) says the missing neutrinos “means that the sun's output of radiant energy is generated, not by thermonuclear fusion processes in its own deep interior (a fact independently confirmed by the missing neutrinos), but from the gravitational energy released by its inward collapsing process.” (*Id.* at 170) This is totally in conflict with reality!

Given the evidence from a number of sources indicating that ***nuclear fusion cannot be the mechanism by which the sun generates its power*** leaving gravitational collapse as perhaps the only viable theory it is a good bet that recent-creationists will continue to look for clear evidence that the sun is, indeed, shrinking. (*Id.* at 64.)

Ackerman assumes gravitational collapse would predict a shrinking sun, but he never cites any authority or mentions details that make us confident this is correct. He thus has misstated facts and said that nuclear fusion is not producing at all any solar energy. This is wrong. Then Ackerman says this means only “one” other viable theory remains. This is also wrong.

By the time of Ackerman’s piece, many neutrinos were found, just not enough to match the prediction of what a nuclear furnace in the sun would produce. And in fact, investigation on three fronts were ongoing to explain this puzzle, including one idea that neutrinos often transmute into undetectable particles.⁷

Problem of ‘Missing Neutrinos’ Solved

Incidentally, the puzzle was completely solved eight years later. It is now known that neutrinos oscillate between three different forms. Since our major neutrino detectors are only sensitive to some of those forms, they counted only some of the solar neutrinos.⁸ The neutrinos thus were never truly ‘missing.’ They were simply undetectible by our scientific equipment. Hence, the sun is 100% powered by thermonuclear reactions.

7. Hartman, *Astronomy, supra*, at 322.

8. See Sverker Johansson, “The Solar FAQ Solar Neutrinos and Other Solar Oddities, by http://www.talkorigins.org/faqs/faq-solar.html#_Toc430357870 (accessed 11-24-07).

Yet, even as Ackerman was writing, if he wanted to attack the thermonuclear theory, that cause was lost. If he had wanted to find a second cause of energy production that thus explained why neutrinos were not detected in sufficient amount, then Ackerman should have done that. And after doing that Ackerman could have told us what remains of his age of the earth argument. As it stood even before the modern proof of why some neutrinos go undetected, Ackerman never made his case that the sun is young from scientifically verifiable facts.

Sun is Shrinking Issue

Ackerman also raises one's distrust for the thermonuclear theory by resort to claims that turned out to be based on quite spurious evidence. Ackerman cites reports in 1979 that the sun was thought to have been shrinking which he acknowledges were later "claimed" in a 1983 article to have been disproved.⁹

What Ackerman overlooked is that the rebuttal disproofs first came back in two separate articles in 1980, causing the proponents of the shrinking sun theory to abandon their thesis.¹⁰ Then the conclusive resolution of this shrinking sun debate came in 1981 — a dozen years prior to Ackerman's book. The issue was put to rest by the precise photoelectric measurements of Barry LaBonte and Robert Howard.

9. Reputable scientists made this mistake, and suggested the sun may have been shrinking. They relied upon records kept by the British Royal Observatory since the 1700s. Thus, it was initially suggested in 1979 that the sun was shrinking, which can *temporarily* happen even in an ancient sun. See John A. Eddy & Aram A. Boornazian, "Analyses of Historical Data Suggest Sun is Shrinking," *Physics Today* 32, No. 9 (September 1979) at 17. In 1983, all the spurious data from old observations was re-examined and reconciled with the conclusion that "there is no evidence for any secular change in the solar diameter." John H. Parkinson, "New measurements of the solar diameter," *Nature* 304 (August 11, 1983) at 518-20. To his credit, Ackerman cites and quotes this passage.

Their measurements show that during the period 1974 to 1981 the solar radius remained constant to within one part in 9,000.¹¹ This was confirmed again in 1998.¹² There is no shrinking sun.

Without Ackerman ever analyzing the proof from that 1983 article, Ackerman then says whether the sun is shrinking “at present we do not know.” Excuse me, but if a scientist says he has disproved the notion, and you even cite him, then you cannot simply brush him aside and say that the answer is “unknown.” To say this, you must examine his authorities and reasoning, and show his evidence provokes enough uncertainty that the issue is really “unknown.”

Rather, the data was proved in the two 1980 articles to consistently show over many years *no change*. This is what the 1983 article referenced, and what Ackerman is not permitted to ignore.

Thus, Ackerman’s statement that the sun may indeed be shrinking is a non-sequitur from the proof he even provided. Scientific discussion requires your best analysis, not just admitting conflicts at one time existed in the literature.

10. Shapiro in *Science* (April 4, 1980) v.208, at 51-53 analyzed measurements of transits of the planet Mercury across the solar disk from 1736 to 1973, and showed that the size of the Sun has remained constant during that time within 0.3 arcseconds. Then again in 1980, Parkinson, Morrison, and Stephenson in *Nature* (Dec. 11, 1980), v.288, at 548-551 re-analyzed the Greenwich data from 1715 onward, taking into account the changes in instrumentation over that period, changes in the transparency of the atmosphere, and differences in the person making the measurements. They showed that the uncertainty in Eddy and Boornazian's data is much too large to support their claim. “Even J.A. Eddy himself was so convinced by these refutations that he never again referred in print to his research on this subject.” (Matthew S. Tiscareno, “Is There Really Scientific Evidence for a Young Earth?,” at <http://www.geocities.com/CapeCanaveral/Lab/6562/youngearth/yeclaims.html#shrinking> (accessed 12/20/07).)

11. LaBonte & Howard, *Science* 214 (1981) at 907-09. See also John Gribbin’s “The Curious Case of the Shrinking Sun,” *New Scientist* (March 3, 1983) Vol. 97, at 592.

Once the problem is solved, you cannot claim the problem persists and the answer is “unknown.” That is utterly unfair and misleading to your reader.

Consequently, as one Christian commentator Matthew S. Tiscareno says,

the claim of a shrinking Sun was refuted less than a year after it was published [in 1979], and should not be used as evidence for the age of the Solar System.¹³

The fact this claim persists today — 2007 — is only due to the irresponsibility of leaders of the Young Earth movement. They virtually never admit they ever make mistakes. They leave their errors behind to trap the unwary. This leads men like Ackerman to repeat their nonsense incessantly.

But what is really self-evident is this nonsense was originally concocted even when the science proved the shrinking sun was wrong theory. Young earth scientists do not really care about science. Rather, they are merely hunting for *problems* to pose, without any concern for accountability for whether *answers* are ever found.

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12. A more recent measurement of the solar diameter is that of T.M. Brown & Christensen-Dalsgaard (1998) in an article entitled “Accurate determination of the solar photospheric radius,” reprinted at <http://xxx.lanl.gov/abs/astro-ph/9803131>. From data taken over the period 1981-1988, they report a radius of $695,508 \pm 26$ km, with no evidence of change over time. The issue of surface definition is discussed at some length. The sun has no surface to speak of, and thus measuring its diameter requires definition. Using new definition methodology, Brown provides a definition which creates a diameter 500 km smaller than that used in most previous estimates. This does not mean the sun is shrinking. It means the definition of a diameter has shrunk.
13. Matthew S. Tiscareno, “Is There Really Scientific Evidence for a Young Earth?,” at <http://www.geocities.com/CapeCanaveral/Lab/6562/youngearth/yeclaims.html#shrinking> (accessed 12/20/07.)

Conclusion

In sum, the sun is powered by thermonuclear power. The presence of neutrinos proves this all along. The missing neutrino problem has been solved. Nothing proves that the sun is presently powered by anything else. The sun is not shrinking, and thus gravitational collapse is not generating heat from the sun. The most precise observational data establishes this. For Ackerman to claim the lack of detection of predicted neutrinos ruled out thermonuclear reaction was shocking, frankly, since in the prior breath he acknowledged that neutrinos were evidence of thermonuclear reactions. Time and science has now explained that our detection equipment was previously inadequate for the task. There were never missing neutrinos. There were only as yet undiscovered neutrinos. For Ackerman to leave open the suggestion that the sun, however, was shrinking, and we do not know the answer, was patently contradicted by scholarship in print more than 12 years prior to the 1993 edition of his book!

*So-Called Temperature Dilemma in the Sun:
Dogma Causes A Failure to See Design*

Ackerman in *It's A Young World After All* (1993) points out that if the sun were operating by nuclear fusion, then in the past it would have been fainter and cooler than it is now. This is correct, and he cites a reputable source: "The Faint Young Sun and the Warm Earth," *Science News* 111 (March 5, 1977) at 154. He claims that the expected difference 1 billion years ago would be 5 percent less luminosity, but that is enough to make the earth solidly frozen in a crust of ice. He then cites the *Science News* article that the earth was early on tropical and warmer than it is now. Physicists were quoted in the article as saying: "The discrepancy . . .

indicates that there is a serious problem with our understanding of the structure of the sun, or of our understanding of the earth's climate or both."

Ackerman concludes from this that the sun does not burn by nuclear fusion. He says:

With the completion of the solar-neutrino program, and in light of these earlier observed difficulties, one is left with the conclusion, in spite of evolutionary dogma to the contrary, that ***the available data indicate that the sun does not produce its energy by thermonuclear fusion and must not be very old.*** This finding reinstates gravitational collapse as a viable model for generating the sun's energy and rules out the possibility of the vast ages hoped for by the proponents of Darwin's theory. (*Id.* at 61). (Emphasis added.)

This is an unsupportable conclusion.

If the sun's luminosity were less long ago, a good scientist would try to find what other offsetting causes could have protected life from runaway freezing. There is no question the sun uses nuclear fusion. The solar-neutrino research proved that. Ackerman simply never "gets" the significance of that research even though he himself agreed earlier that neutrinos were clear evidence of thermonuclear reaction in the sun.

Moreover, if the sun's luminosity were less one billion years ago, and it could be proven that life would have frozen then, Ackerman misses a moment to ponder the Providence of God in making some means of protection for life. And it turns out that reputable scientists publishing in the most respected journals all agree prior to 1993 (the date of Ackerman's first publication date of his book) on a quite amazing mechanism at work to protect life. By Ackerman's refusal to consider scientific alternatives except those leading to a young earth, he ignores valid arguments for proving from science a design and providential care in nature.

Providence At Work In Temperature History of Earth

What scientists have discovered is that the earth's early atmosphere was much heavier with carbon dioxide whose chemical name is CO₂. This element acts like the car window that allows light to enter which in turn is reradiated as infrared light. The window will not let the infrared light escape. This creates the build-up of heat inside the car to a temperature greater than outside the car. This is the greenhouse effect likewise created by CO₂ in the earth's atmosphere. Early earth was unusually warmed by CO₂ gases.

By Ackerman ignoring this, he misses one of the examples of multiple coincidences that defy chance but which were necessary to permit life on earth. It is related to the CO₂ gases, and was first explained by Tobias Owen, Robert D. Cess, & V. Ramanathan, in "Enhanced CO₂ Greenhouse to Compensate for Reduced Solar Luminosity on Early Earth," *Nature* 277 (1979) at 640-41. Many other scientists have documented this amazing symbiosis.

When the sun passed into its stable burning phase, it underwent a very gradual increase in its luminosity. Plants originated early in earth's geological history, and they extracted the CO₂ from the atmosphere and released oxygen. This decreased the greenhouse effect but was balanced off *exactly* by the gradually increasing luminosity of the sun. (There has been about a 35% increase in the sun's luminosity since plants first existed.) This change in luminosity would otherwise have been enough to exterminate life. Life survived because ***the increase in solar luminosity was exactly cancelled out each step of the way by a decrease in the efficiency of the greenhouse effect in Earth's atmosphere due to growth in plants.***

Scientists have studied this as one more example of the anthropic principles (*i.e.*, factors delicately balanced to make life possible on earth). They point out that if the rate of luminosity increase had been slightly greater, then we would have had a runaway greenhouse effect on earth just after the plants but before vertebrate life. Had the rate of increase in

the sun's luminosity been slightly smaller, then runaway freezing of oceans and lakes would have occurred. Snow and ice reflect better than other materials on earth. As a result, less solar energy would have been absorbed by earth, and the surface temperature would have decreased. This would cause more snow and ice, and the condition would reach a permanent phase. Either way, the planet's temperature would become too extreme for advanced life or even for the long-term survival of primitive life.¹⁴

In fact, the process was far more delicate than this. The Moon in its early stages also exerted a strong gravitational friction that gradually melted the Earth's mantle sufficiently to release the first CO₂ gases that formed Earth's first atmosphere.¹⁵ This made it very warm on earth when the sun was much colder. The Moon also extracted besides C₂O, all the water that was bonded inside the earth's mantle. (This made large oceans possible.) Plants then arose to begin cancelling out the runaway greenhouse effect. However, then the forces of the Moon as the Moon moved further and further from earth helped early life survive once more. By this time, the Moon's gravitational pull contributed probably to the

14. See Allen H. Hammond, "The Uniqueness of the Earth's Climate," *Science* 187 (1975) at 245; Owen B. Toon & Steve Olson, "The Warm Earth," *Science* 85 (October 1985) at 50-57; Michael H. Hart, "The Evolution of the Atmosphere of the Earth," *Icarus* 33 (1978) at 23-39; Tobias Owen, Robert D. Cess, & V. Ramanathan, "Enhanced C₂O Greenhouse to Compensate for Reduced Solar Luminosity on Early Earth," *Nature* 277 (1979) at 640-41; Michael H. Hart, "Atmospheric Evolution, the Drake Equation, and DNA: Sparse Life in an Infinite Universe," *Philosophical Cosmology and Philosophy* (John Leslie, ed.) (N.Y.: Macmillan, 1990) at 256-66.

15. *The Making of the Earth* (1985), *supra*, at 65-67. Preston Cloud Jr. explains: "If the Moon was captured, tidal friction sufficient to induce subcrustal melting would have been likely. Melting, in turn, would have promoted outgassing and accretion of atmosphere and hydrosphere, together with a general resetting of the geologic clocks. Any pre-existing atmosphere and hydrosphere would have been lost at that time, and a new or first atmosphere and hydrosphere started." *Id.* at 66-67.

rapid removal of the same greenhouse gases it once introduced. The Moon thereby helped plants in their effort to remove CO₂ gases on Earth, thereby preventing Earth from meeting the fate of Venus (*i.e.*, runaway boiling).¹⁶

The growth in plant life continues to be necessary to offset the increasing luminosity of the sun. This is one of the reasons why ecologists are fighting to protect forests and plant life.

You thus have multiple effects over 4 billion years that were delicately balanced to make life possible:

- The Moon extracting CO₂ gasses when the sun was cooler to prevent freezing.
- The CO₂ gasses warmed the Earth's surface to the point that plants were possible.
- Just at the point necessary to stop the greenhouse effect from CO₂, two coinciding effects arose: (a) plants arrived and gobbled up CO₂; and (b) the Moon moved further away and its gravitational pull helped remove more rapidly the greenhouse gases (CO₂) from Earth's atmosphere.

You might be tempted at first to say this is a lucky series of coincidences. However, once you determine the likelihood of the origin of the Moon (*i.e.*, its strange non-equatorial orbit) and plants (which has chlorophyll — a substance with no analog in inorganic compounds), you will see that the odds of this coincidence happening without assistance is so remote that a practical person must concede it is not chance. And yet we depend every moment of every day on the continued pattern of this coincidence as the sun's luminosity continually and gradually increases.

Ackerman omits mentioning any of this. Instead, he says that the high improbability that life could survive the sun's increasing luminosity if it truly were over 1 billion years old is proof that the sun is a recent phenomenon. Acker-

16.Fred Hoyle, "The Universe Past and Present Reflection," *Annual Review of Astronomy and Astrophysics* 20 (1982) at 16.

man is claiming that life never went through such a dangerous period. Thus, one of God's most ingenious revelations of His providential ordering of events is deemed by ICR as so improbable that it *never* happened. God's loving actions are actually denied to have taken place even though general science is forced to concede this bizarre sequence of coincidences *historically* did take place *as a matter of fact*.

Conclusion

All Ackerman's arguments about the sun were wrong. In bringing them forward, Ackerman overlooked one of the best proofs for creation: the temperature history of earth. This amazing series of 'coincidences' prove providence. If one is obsessed with proving flawed ideas of a young-earth, it is easy to overlook such important proofs. We need to take the mote out of our eye so we can see the great providence of God all around us.