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References

- Beus, S. S. 1969 Devonian stratigraphy in N. W. Arizona. Geology and natural history of the Grand Canyon. Four Corners Geological Society 5th Field Conference Guidebook, pp. 127-33.
- Billingsley, G. 1986. Personal correspondence with G. F. Howe.
- Burdick, C. L. 1974. Canyon of canyons. Bible-Science Association, Minneapolis, MN.
- Collier, M. 1980. An introduction to Grand Canyon geology. Grand Canyon Natural History Association, Grand Canyon, AZ.
- Gutschick, R. C. 1986. Private correspondence with G. F. Howe.
- Huddle, J. W. and E. Dobrovolsky. 1952. Devonian and Mississippian rocks of central Arizona. U. S. Geological Survey Professional Paper 233-D:67-112.
- Longwell, C. R. 1928. Geology of the Muddy Mountains Nevada. United State Geological Survey Bulletin 798, Washington, D. C.
- McKee, E. D. and R. C. Gutschick. 1969. History of the Redwall Limestone of Northern Arizona. Geological Society of America Memoir 114.
- McKee, E. D. 1945. Cambrian history of The Grand Canyon region. Carnegie Institution Washington Publication 563, p. 21.
- McKee, E. D. 1951. Sedimentary basins of Arizona and adjoining areas. *Geological Society of America Bulletin* 62(5):481-505.
- McKee, E. D. 1976. Paleozoic rocks of Grand Canyon. Geology of the Grand Canyon. edited by W. J. Breed and E. Roat. Museum of Northern Arizona, Flagstaff.
- McKee, E. D. 1969. Paleozoic rocks in Grand Canyon. Geology and natural history of the Grand Canyon region. Four Corners Geological Society 5th Field Conference Guidebook, pp. 78-90.
- McNaire, A. H. 1951. Paleozoic stratigraphy of part of northwestern Arizona. *American Association of Petroleum Geologists Bulletin* 35(3):503-41.
- Nations, D. and E. Stump. 1981. Geology of Arizona. Kendall/Hunt Publishing Co., Dubuque, IA.
- Noble, L. F. 1914. The Shinumo quadrangle: Grand Canyon districts, Arizona. U. S. Geological Survey Bulletin 549:100 pp.
- Noble, L. F. 1922. Paleozoic formations of the Grand Canyon. United States Geological Survey Professional Paper 131-B, pp. 22-73
- Schuchert, C. 1918. The Carboniferous of the Grand Canyon of Arizona. *American Journal of Science*, 4th series 45:347-61.
- Shelton, J. S. 1966. Geology illustrated. W. H. Freeman Co., San Francisco.
- Stoyanow, A. 1948. Some problems of Mississippian stratigraphy in southwestern United States. *Journal of Geology* 56(4):313-26.
- Walcott, C. D. 1888. Pre-Carboniferous strata in the Grand Canyon of the Colorado, Arizona. *American Journal of Science*, third series 26:438-9.

THE DILEMMA OF A THEISTIC EVOLUTIONIST: AN ANSWER TO HOWARD VAN TILL

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Abstract

Regardless of the attack of a theistic evolutionist, the gravitational contraction theory arguments used by creationists are still valid. Some other young earth arguments are discussed.

Introduction

The theistic evolutionist is a classic example of an antagonist trapped between the horns of a dilemma. He cannot have his cake and eat it. The argument is sharply defined when one horn of the dilemma is a recent creation and the other horn is evolution. These are mutually exclusive positions.

It takes but one proof** of a young-age limit on the earth, the moon, or the sun to refute the whole gamut of evolution. There are many proofs. Lord Kelvin gave two young-age proofs that have never really been falsified. Lord Kelvin chided the evolutionary geologists for their ignorance of the fact that limits on the earth's age can be established from straightforward physics. There is much more evidence of a young-age of the earth, moon, and sun now than at the time of Kelvin.

Two attributes of a valid proof are: 1) Founded on sound physical theory. 2) Consistent with the scientific evidences.

There is no lack of scientific evidences of a young age for the earth, moon, sun, and some of the other astronomical bodies. There is no lack of sound physical theories upon which to found those proofs. The problem is with the attempts of evolutionists (theistic

and secular) to gloss over the physical theory and to suppress the evidence.

Theistic Evolutionist Van Till's Strategy

In a recent paper theistic evolutionist Howard J. Van Till, Professor of Physics and Astronomy at Calvin College, Grand Rapids, Michigan, challenges the scientific evidences and theoretical support for a recent creation. His paper is entitled "The Legend Of The Shrinking Sun: A Case Study Comparing Professional Science and Creation-Science' in Action" (Van Till, 1986, pp. 164-74). His strategy is:

- 1) Attack the credibility of all creationist scientists, the *ad hominem* approach.
- 2) Concentrate on one young-age case he thinks is most vulnerable.
- 3) Cite a multiplicity of conflicting papers to give the appearance of neutralizing the evidence.
- 4) Claim that this demonstrates the lack of credibility of all young-age evidences.
- 5) Gloss over the fact that he never provides evidence for the billions-of-years age position he holds.

One can dismiss his *ad hominem* attack on the credibility of creationist scientists. The eight creationist scientists whom he attacks all have equal or better professional credentials than Van Till.

Van Till objects to creationist scientists raising so many cases for a young age. He classifies them as non-professionals who merely list young-age arguments

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**From valid logic and the scientific evidence.

without adequate scientific support. Whereas Van Till himself resorts to the listing of a multitude of papers. But he is selective. He omits papers that do not support his position.

Papers Van Till Did Not Cite

Two papers that Van Till did not list are: 1) a paper by John A. Eddy, an evolutionist. 2) a paper by Robert V. Gentry, a creationist. Those two papers were presented April 13, 1978 at the Geochronological Symposium, Louisiana State University, in Baton Rouge (Kazmann, 1978, pp. 18-20). That symposium specifically addressed the evidences for a young-age vs. those for 4.5 billion year age.

Van Till chose to isolate shrinking-sun evidence from all other evidences. But Eddy's paper is on shrinking sun evidence. Why did Van Till omit that paper? There might be two reasons: It provides not only shrinking-sun evidence of a young sun, it provides other theoretical and observational evidences of a young sun. This same reference (Kazmann, 1978) also contained companion support for a recent creation, the paper by Gentry. The combination of Gentry and Eddy's papers shows the overall consistency in creation-science, evidence of creation and young-age.

Eddy's 1978 Symposium Paper

Here are quotes from the *Geotimes* report on Eddy's paper (Kazmann, 1978):

There is no evidence, based solely on solar observations, that the sun is $4.5\text{-}5 \times 10^9$ years old.

Astronomy, as an observational science, can say nothing about chronology as far back as 4.7×10^9 years. Theoretical astronomy says that in the distant past the sun should have been cooler and radiating less. This is the faint star problem, but climate models say that given 1% less radiation from the sun you have a little ice age. If the sun were 15-20% less bright, ice would have covered the Earth . . . Resolution of that mystery is a task for the future.

The research reported in Eddy's symposium paper was based on the time it takes the sun's diameter to cross the meridian, measured at the Royal Greenwich Observatory. Those measurements showed that the transit time is getting smaller. The sun's orbital speed is not increasing. So the diameter of the sun must have been getting shorter, a shrinking sun.

This included more than a hundred years of observations. Everyone agrees that a shrinking sun implies a young-age sun. The debate is whether or not the sun is shrinking. Eddy's research shows that it is. At this same symposium Gentry provides another blow to the evolutionary hypotheses.

Two of Gentry's Papers

Gentry's paper gives radiometric evidence of the creation of the earth's basement granite in less than a day's time. Here is a quote from the *Geotimes* report on Gentry's paper:

Polonium 218 halos are the center of a mystery. The half-life of the isotope is only 3 minutes. Yet the halos have been found in granitic rocks at considerable depths below land surface, and in all parts of the world . . . The difficulty arises from

the observation that there is no identifiable precursor to the polonium; it appears to be primordial polonium. If so, how did the surrounding rocks crystalize rapidly enough so that there were crystals available ready to be imprinted with radiohalos by alpha particles from polonium 218?

Van Till excluded not only that paper but another related paper by Gentry. It supports not only the creation but also a young age for the earth. It was published in the *Annual Review of Nuclear Science* (1973) Volume 23. Here are quotes from that paper (p. 24):

The simple evidence of halos is that the basement rocks of the earth were formed solid . . . Halos in other minerals can be shown to give equally startling evidence of a young earth.

Van Till Attacks The 1979 Eddy-Boornazian Paper

Van Till attempts to discredit the data and analysis in a 1979 paper jointly authored by John A. Eddy, the astronomer, and Aram Boornazian, the mathematician. The title of their paper is "Secular Decrease in the Solar Diameter 1836-1953." Their paper is based on the solar meridian transit-time data at the Royal Greenwich Observatory. The conclusion is the same as that of Eddy's symposium paper, namely the sun's diameter is shrinking two arc seconds per century. That translates into a shrinkage of five feet per hour. In so far as the data are concerned this shrinkage is a secular phenomenon, a continuing process. There is no way a theistic evolutionist, such as Van Till, can live with Eddy and Boornazian's data and analysis. It provides scientific evidence of an age limit of thousands of years, not billions, on the sun's age.

Scientific evidence, such as this, completely demolishes the theory of evolution. It is no wonder that evolutionists (theistic or secular), put up such a fight against this evidence. They can not repeat those measurements, made over the last hundred plus years. But they really try to reinterpret them.

The pioneering researchers, Eddy and Boornazian were careful not to make judgmental adjustments. They took the results as they are. As an evolutionist, Eddy does surmise that this may be temporary shrinking, but he acknowledges no evidence to support that conjecture. He stands by his data and has the integrity to state:

However . . . I suspect that we could live with Bishop Ussher's value for the age of the Earth and Sun. I don't think we have much in the way of observational evidence in astronomy to conflict with that (Kazmann, 1978).

Eddy was aware of a solar eclipse observation that supported the sun shrinkage for more than 400 years. That evidence is provided by a 1567 solar eclipse (Lubkin, 1979, p. 17). The sun was too large to be blocked out by the moon. That is known as an annular eclipse, an annular portion of the sun showing. No record of an eclipse with as large an annulus has been recorded since 1567. This is visual evidence that the sun was larger in 1567.

Van Till's Bias Is Showing

The following quote illustrates Van Till's mind-set, his unquestioning faith in the evolutionary long-age.

But truly secular shrinkage, that is, a steady decrease in size over an indefinite long period of time, would be at odds with contemporary models of solar behavior and inconsistent with geological evidence (p. 166).

To keep the faith, Van Till must refute Eddy and Boornazian's data and analysis. So he asks the question: "Where did Eddy and Boornazian go wrong?" Then he nit-picks at the data of the Royal Greenwich Observatory, one of the most noted observatories in the world. He provides nothing of quantitative value:

It appears that the Greenwich data contain some systematic errors . . . there were changes in both the methodology and the instrumentation employed in the Greenwich data . . . along with significant variations in both the skill of observers and the quality of observing conditions . . . The data on which Eddy and Boornazian based their conclusions are plagued with subtle flaws (p. 168).

These alleged flaws must have been subtle indeed. One would be hard pressed to detect them in the plot of the original data, adapted from Gloria B. Lubkin's article in *Physics Today* (1979). That plot supports the credibility of Eddy and Boornazian's analysis and shows only one discontinuity, and that does not alter the trend.

Van Till cites papers that are supposed to prove that the sun is not shrinking. But he does not apply the same criteria. He does not nit-pick that data, no mention of such difficulties as: 1) observational times of a hundred years or so, 2) changes in both methodology and instrumentation, 3) variations in both the skill of the observers and quality of observing conditions.

In spite of his special treatment of those papers, almost all of the authors acknowledge or "allow" some decrease in the sun's size. Those acknowledged shrinking rates, or reluctantly "allowed" shrinking rates, yield an age too short for evolution. Continuous shrinking even at a much much smaller rate than the two arc seconds per century rate demolishes his billions-of-year hypothesis.

Papers Van Till Quotes

"S. Sofia, J. OKeefe, J. R. Lesh and A.S. Endal (1979, p. 1306) published an article in *Science* which expressed the judgment that, on the basis of available data (mostly from meridian transit observations), the sun's angular diameter did not diminish by more than 0.5 arc second between 1850 and 1937." That is no help to Van Till. That rate of shrinking yields a limit on the sun's age in the thousands of years.

"Irwin Shapiro (1980, p. 51) published his analysis of the transits of Mercury in front of the sun from 1736 to 1973. Shapiro concluded that no significant change in the sun's diameter could be detected, and that the maximum shrinkage rate allowed by the data was 0.3 arc second per century, about one seventh of the Eddy- and Boornazian value." He adds a graph with large error bars. It is nothing like as definitive as the Lubkin graph. But here again, evolutionists can not live with a 0.3 arc second per century shrinking sun.

"Similarly, D. W. Dunham et alia (1980, p. 1243) analyzed solar eclipse data and concluded that between 1715 and 1979 the sun's diameter may have decreased, but only by 0.7 arc second, equivalent to a

rate of about 0.25 arc second per century." That is about one eighth of the Eddy and Boornazian value, still a high enough shrinking rate to restrict the solar age to thousands of years.

J. H. Parkinson, Leslie V. Morrison and F. Richard Stephenson performed a "re-evaluation" and concluded that the trends in the Greenwich data reported by Eddy and Boornazian are "the result of instrumental and observational defects rather than real changes." They state that "In their judgment—no secular change over the past 250 years was detectable, but a cyclic change with an 80-year periodicity was indicated."

This "re-evaluation" was an obvious case of attempting to "realign" the Eddy and Boornazian data to a no-shrink condition. The conclusion that the shrinking is "the result of instrumental and observational defects rather than real change" appears to be more arbitrary than objective. It is somewhat redeeming that the phrase "in their judgment" was included to acknowledge that there was judgment involved.

"R. L. Gilliland (1981, p. 1144) confirmed the presence of a 76-year periodic variation in the sun's diameter, but suggested that the data do allow for a very small long term shrinkage at the rate of 0.1 arc second per century during the past 265 years." That rate still yields an age limit far below anything evolutionists will concede.

One thing is clear: the preponderance of the evidence indicates a shrinking sun. Whose judgment was it that discarded the 1567 solar eclipse data? That evidence went back about 150 years further. It provided visual evidence of an oversize sun. Its appreciable annulus was showing.

The case for a shrinking sun still holds. The only valid argument is its precise rate of shrinking. That is important and is a worthwhile goal of research. The Eddy and Boornazian rate may be too fast—too much heat energy, for a straightforward potential to heat conversion. A somewhat slower rate may provide the heat production rate that is consistent with gravitational contraction theory.

Nuclear-Fusion Theory In Trouble

The evolutionist is in trouble not only because of the evidence of a shrinking sun. He is in trouble on the theory of energy production for the sun. The widely held nuclear-fusion theory of the source of heat energy for the sun ran into serious trouble in the 1960s. The famous experiments by Raymond Davis showed that: The magnitude of neutrino flux which the theory predicted just is not there.

Van Till (p. 168) acknowledges the problem.

During the past several years, measurements have been performed to determine the rate at which neutrinos, a byproduct of these fusion reactions, are being received on earth. The puzzling result is that the measured rate is only one third of the expected rate.

The failure of this theory is devastating to evolutionary astronomy. It has been the basic theory for the evolution of stars, the sun included. As might be expected astrophysicists have been trying to come up with another thermonuclear theory for stellar evolution.

Some have claimed new properties for the neutrino. Instead of the neutrino having no rest mass, it is claimed to have rest mass. There are attempts to fabricate a theory to fit the smaller neutrino flux. These are still in a conjectural state. The undeniable fact is, stellar evolution has been kept afloat for decades by means of an invalid theory.

Gravitational Contraction Theory

The gravitational contraction theory of solar heat energy was the prevailing theory until sidetracked by the invalid nuclear-fusion theory. The gravitational contraction theory was rejected, not on the basis of any defective physics. It was rejected because it does not provide the billions-of-years age demanded by evolutionists. It is still a valid physical theory that has not been falsified.

The basic principle is that the potential energy lost in contraction is transformed into heat. If there is contraction, this transformation will take place. Heat will be produced. The aforementioned evidence of a shrinking sun is evidence of gravitational contraction that generates heat in the sun.

Kelvin used that theory in support of a young-age limit on the sun. With the data mentioned in this paper, there is stronger support of gravitational contraction energy production in the sun. Even if the total sun shrinkage rate were only one tenth of the Eddy-Boornazian value, the gravitational contraction energy would be more than enough to produce the sun's entire luminosity. (Steidl, 1980, p. 64).

Van Till's Assertions

Van Till's assertions picture creationist-scientists as:

- 1) Merely listing others' "scientific evidences" of a young earth, no research of their own.
- 2) Biblically naive, taking the creation account literally.
- 3) Destroying the credibility of Christian witness.

Here are samples of Van Till's assertions (pp. 164-5):

- 1) Advocates of the young earth hypothesis frequently publish extensive lists of 'scientific evidences' which they claim provide observational support for their recent creation scenario.
- 2) According to the young earth proponents, the universe must have been created in a mature and fully functioning form by divine fiat.
- 3) We must be aware of their persuasive impact on the Christian community and of their negative effect on the Christian witness to a scientifically knowledgeable world.

Only one of those assertions is correct. We do indeed believe in the Biblical account of fiat creation of a mature and fully functioning universe. We are not caught in a dilemma, attempting to adapt Scripture to the false science of evolution.

Christianity Today Article

Van Till was particularly concerned with this author's article (Barnes, 1982, pp. 34-6) in *Christianity Today*, which was one of four articles in the Origins Debate: two supporting the creation-science position, Duane Gish and Thomas Barnes, and two supporting the theistic evolution long-age position, Davis A. Young of Calvin College and V. Elving Anderson. (pp. 28-45).

Van Till (p. 170) states that: "Thomas Barnes presents a list of six evidences for a recent creation." Van

Till only attempts to challenge one of those evidences, the shrinking sun evidence. Since he has such a weak case against the shrinking sun, one wonders why he did not challenge the other five evidences.

One of those other five evidences is Robert Gentry's radiometric evidence of rapid creation. That has already been discussed. But since Van Till considers it naive to believe in fiat creation, one would think a scientist of his caliber would stand up and challenge Gentry's radiometric evidence. Of course it might be somewhat of a task, since Gentry is the world's best scientist in that field.

Another one of those recent-creation evidences that Van Till chose to ignore is the small depth of accumulated dust on the moon. Before the Apollo landings on the moon, evolutionary scientists had given NASA much concern about deep dust. "Sand shoes" were installed on the lunar landing craft. Their evolutionary advisors predicted great depths of dust on the moon, a "quicksand" hazard. *Astronomer Thomas Gold* (1985, p. 70) predicted that spacecraft to land on the moon would encounter a mile-thick layer of dust.

The rate of influx of cosmic dust had been known within reasonable limits. If the moon really were 4.5 billion years old, the depth of dust would have been great and a real hazard for the Apollo astronauts. However, it is clear now that there is only a few thousand years of dust on the surface of the moon.

One measure of the credibility of a scientific theory is how well it predicts. There is no credibility in how well its failure is explained away later by those "trained in science."

Magnetic Evidence of a Young Earth

Another one of those recent-creation evidences, that Van Till chose to ignore, is the magnetic evidence of a young earth. Contrary to Van Till's assertions that the creation-scientists only list others' evidences and do not keep up with the literature, it is he that has not kept up with the literature. Eight of this author's research publications, from 1971 to 1986, are on the magnetic evidence of a young earth (Barnes, 1971, pp. 24-9; 1972, pp. 47-50; 1973, pp. 222-30; 1975, pp. 11-3; 1977, pp. 41-6; 1981, pp. 39-41; 1983; 1986, pp. 30-3).

All of the historical evaluations of the earth's magnetic dipole moment, the only valid measure of the state of the earth's basic magnet, indicate a monotonic decay. The half-life of its magnetic field is 1400 years, and of its magnetic field energy is 700 years. There is no way one can account for more than a few thousand years for the earth's basic magnet.

This decay process is precisely what one would expect from the electromagnetic solution to the problem. One must begin with an initial postulate. The only reasonable initial postulate for a consistent scientific theory of that decaying system is an initial fully functional electromagnet. Fiat creation is the only sensible postulate. One thing is certain: the evolutionists have no justifiable initial postulate nor physically valid theory to go with any of their postulates. Does Van Till have one to offer?

New Research

New research is continually bringing out additional evidences of the consistency of the fiat creation and

young-age position in science. Van Till notwithstanding, a listing of publications of that research should not be suppressed.

A new approach to astronomical ages is being developed by Dr. Harold S. Slusher. The first three publications to be released on Dr. Slusher's research are in the form of short technical papers called *Tutorial Papers*. They are: 1) *The Stars— Their Birth* (1986a) 2) *Star Birth in the Milky Way: One Aspect* (1986b) and 3) *The Protoplanet Hypothesis and Tidal instability in the Solar System* (1987). They give strong support to equal ages for stars in the Milky Way, and young-age limits on certain astronomical bodies.

A number of recent graduates' *Master of Science Theses* have provided additional evidences of young age. There are too many to list here. But Stanley Rasmussen's new book *Geologic Age of River Deltas* (1987), which provides strong evidence of a very young age, is a follow up on his thesis research.

The important point to make is that creationist scientists are producers. No amount of suppression is going to stop their progress. They have no dilemma. Their science is founded upon sound fundamentals and the sensible postulate of a created origin, yes, a mature and functioning universe.

References

- Anderson, V. Elving, Thomas Barnes, Duane Gish and Davis A. Young, 1982. In the beginning. *Christianity Today* XXVI(16): 28-45.
- Barnes, Thomas G. 1971. Decay of the Earth's magnetic moment and the geological implications. *Creation Research Society Quarterly*. 8:24-9.
- . 1972. Young age vs. geologic age for the Earth's magnetic field. *Creation Research Society Quarterly*. 9:47-50.
- . 1973. Electromagnetics of the Earth's field and evaluation of electric conductivity, current, and joule heating in the Earth's core. *Creation Research Society Quarterly*. 9:222-30.
- . 1974. Physics: a challenge to "Geologic Time." Impact No. 16. Institute for Creation Research. El Cajon, CA.
- . 1975. Earth's magnetic energy provides confirmation of its young age. *Creation Research Society Quarterly*. 12:11-2.
- . 1977. Recent origin and decay of the Earth's magnetic field. *Journal of Society of Interdisciplinary Studies*. II(2):41-6.
- . 1981. Satellite observations confirm the decline of the Earth's magnetic field. *Creation Research Society Quarterly* 18:39-41.
- . 1982. Evidence points to a recent creation. *Christianity Today*. XXVI(16)34-6.
- . 1983. Origin and destiny of the Earth's magnetic field (second edition) Institute for Creation Research. El Cajon. CA.
- . 1986. Earth's young magnetic age confirmed. *Creation Research Society Quarterly*. 23:30-3.
- *Dunham, D. W., S. Sofia, A. D. Fiala, D. Herald and P. M. Muller. 1980. Observations of a probable change in the solar radius between 1715 and 1979. *Science* 210:1243.
- Eddy, J. A. and A. A. Boornazian. 1979. Secular decrease in the solar diameter. 1936-1953. *Bulletin of the American Astronomical Society* 11:437.
- *Gilliland, R. I. 1981. Solar radius variations over the past 264 years. *Astrophysics Journal* 248:1144.
- Gold, Thomas. 1985. A theory as good as Gold. *Science* 126:70.
- Kazmann, Raphael G. 1978. It's about time: 4.5 billion years. *Geotimes* 23(9):18-20.
- Lubkin, Gloria B. 1979. Analyses of historical data suggest Sun is shrinking. *Physics Today* 32(9):17
- *Parkinson, J. H., L. V. Morrison and F. R. Stephenson. 1980. The constancy of the solar diameter over the past 250 years. *Astrophysics Journal* 248:548.
- Rasmussen, Stanley A. 1987. Geologic age of river deltas. Geo/Space Research Foundation. El Paso.
- *Shapiro, Irwin I. 1980. Is the sun shrinking? *Science*. 208:51.
- Slusher, Harold S. 1986a. The stars— their birth. Tutorial Paper No. 2. Geo/Space Research Foundation. El Paso.
- Slusher, Harold S. 1986b. Star birth in the Milky Way: one aspect. Tutorial Paper No. 4. Geo/Space Research Foundation. El Paso.
- Slusher, Harold S. 1987. The protoplanet hypothesis and tidal instability in the solar system: Tutorial Paper No. 6. Geo/Space Research Foundation. El Paso.
- *Sofia, S., J. O'Keefe, J. R. Leash and A. S. Endal. 1979. Solar constant constraints on variations derived from diameter measurements. *Science* 204:1306.
- Steidl, Paul M. 1980. Solar neutrinos and young age. *Creation Research Society Quarterly* 17:64.
- Van Till, Howard. 1986. The legend of the shrinking Sun: a case study comparing professional science and "creation science" in action. *Journal of the American Scientific Affiliation*. 38(3): 164-74.

*These are references that Van Till quotes.

MINUTES OF THE 1986 CREATION RESEARCH SOCIETY BOARD OF DIRECTORS MEETING

On Thursday, 17 April, a meeting of the Executive Committee was held at Howard Johnson's Motor Lodge, Ann Arbor, Michigan. On Friday 18 April, between the hours of 0800 and 1600, the Research, Quarterly, Publishing, Constitution and Financial Committees held meetings of approximately two hours. An appointed secretary recorded the discussions in preparation for the Saturday plenary sessions.

The official annual meeting of the board was opened at 1900 hours by President Rusch in Room 102 of the Science Building at Concordia College, Ann Arbor, Michigan. Present: W. Frair, G. Howe, D. Kaufmann, R. Korthals, J. Meyer, G. Mulfinger, W. Rusch, E. Williams, G. Wolfrom, D. Gish, D. DeYoung, J. Klotz, P. Zimmerman, J. Moore, Absent: D. Boylan, N. Smith, C. Burdick. Also present were 17 visitors. The President welcomed everybody to this the beginning of the 23rd year of the Creation Research Society (CRS). This was followed with a silent prayer.

The President introduced Dr. David Schmiel, President of the host college, who welcomed CRS members

and then talked about the program of Concordia College and the training of their students.

The minutes of the 1985 Board of Directors meeting were read. The following have been elected for a three year term on the Board: D. Boylan, D. DeYoung D. Kaufmann, E. Williams and P. Zimmerman.

The Treasurer's report from Klotz indicated that expenses have been reduced. Money in the Laboratory Fund and total cash assets have increased. The property in Arizona contributes to this. One problem is the income decrease in the General Fund. Mailing expenses will rise this coming year due to a postal increase.

Glen Wolfrom reported that the domestic membership has decreased from 1959 in 1985 to 1729 in 1986, but foreign membership has increased. He distributed a new, improved membership form. Membership breakdown in percentage: Voting 33, Sustaining 43, Subscriber 19 and Student 6. Membership may be down due to competition from other effective creation groups.