

Honey, I Shrunk the Sun!
Evolution of a Creationist Myth

by David Bloomberg

I have noticed, in my time as REALL's chairman, that most creationists often follow similar tactics in their attacks on science. They seem to know they cannot win in the scientific arena, so they take their message directly to the less-informed public -- often in the form of "debates" and, increasingly, letters to the editor of newspapers.

These forums provide creationists with a unique opportunity to set forth their claims with little chance of being immediately challenged, as would happen if they, for example, tried to submit a scientific paper to a peer-reviewed journal. In a debate, it is possible that their opponent might have the information handy, but no one person can have all the necessary information, and creationists often make claims that span biology, physics, geology, etc. while the scientists debating them probably only studied one of these fields. In addition, it may take a minute to put forth a false claim, but an hour for an opponent to show why it's false.

A letter to the editor is even better. Anybody can write a letter. They can make any claims they want. There is no "fact checker" for such claims, and there is no opponent who can counter even one erroneous statement immediately. If a reply is published, it often appears one to two weeks later and may not even be seen by some who read the first. Again, there is the problem that correcting an erroneous statement takes much more time and space than making the claim to begin with. I will detail one such example here.

A letter appeared in the State Journal-Register on October 27, from F.R. Hedinger. In this letter, Hedinger was responding to an earlier article about the sun in which there was a statement that the sun is 4.5 billion years old. Hedinger claimed there was no proof to support such this and that it was a "statement of belief." From there, Hedinger launched into a claim that several observatories have been measuring the sun since 1836 and that they have "established that the radius of the sun has actually been shrinking by about 5 feet per hour." If this were true, and if it had been true since the beginning of the sun's existence (which Hedinger assumes), that means the sun would have far too large to allow life on Earth to evolve and, Hedinger claimed, "A 4.5 billion-year-old sun would be absolutely impossible." Hedinger went on to state, correctly, that "it is wrong to present beliefs as facts," (Hedinger should have taken this advice) but adds, without a shred of evidence to back it up, "the evidence uncovered by science more and more tends to confirm the account as presented in the Book of Genesis and to discredit the theory of evolution."

Here we have a perfect example of what I described earlier. Hedinger made a number of claims and provided virtually nothing to back them up. That which Hedinger did provide, about the observatories, certainly sounds like it backs up the claims, and the casual reader would probably have no reason to disbelieve them.

However, I'm not a casual reader. The claims sounded bogus and vaguely familiar to me, but not so familiar that I could immediately fire off a letter in response. A bit of research was in order.

I called the National Center for Science Education (NCSE), who provided me with the information I needed to respond to Hedinger's letter. In addition, they sent me everything I will use to further detail the "shrinking sun myth" in this article.

As I mentioned earlier, it takes very little space to make an erroneous claim, but a great deal more to correct that error. Hedinger's claim about the shrinking sun took only a few lines, but there is a whole book chapter explaining how this myth came to exist: "The Legend of the Shrinking Sun," in *Science Held Hostage* by Van Till (1988). Even responding with just the most important information would have taken pages, but in a response letter to the editor, I only had a couple of paragraphs to make my point.

I summed up Hedinger's error in my letter (which was printed on November 13) by saying "Hedinger has misquoted the tentative conclusion of a 1979 presentation. Further studies showed this to be incorrect, and even one of the authors has since reversed his conclusion!" Certainly, I would have liked to provide more information, but there just wasn't room, so I added our address and web page, and am writing this article to further explain exactly why Hedinger is wrong.

Did a study ever conclude that the sun appeared to be shrinking at a rate of five feet per hour? Yes. But that is only the beginning. The study in question was presented at the 1979 meeting of the American Astronomical Society by John Eddy and Aram Boornazian. It generated a considerable amount of interest because of the puzzle it presented. If, as these results indicated, the sun had been shrinking at such a rate, it meant paleoclimatic evidence and conventional solar models needed to be re-evaluated. Indeed, this was why Eddy and Boornazian presented their paper the way they did. They did not consider the results ready for formal publication so they presented it as a puzzle in a brief talk at the meeting. By doing so, they encouraged other scientists to evaluate their data and interpretation. The vast majority of scientists understand that this is a good example of how a scientific investigation should proceed. Unfortunately, many creationists did not; but more on that later.

The Eddy and Boornazian results were disputed almost immediately. In the same month as the presentation, another group published a paper in *Science* that showed results of less than 1/4 the shrinkage rate. In 1980, another paper concluded the rate was about 1/7 what Eddy and Boornazian had found. Another look at the data by a different team of scientists found that the high shrinkage rates "are the results of instrumental and observational defects rather than real changes," and that team determined there was no overall change over the past 250 years, though there was an 80-year cycle of shrinkage and expansion. Similarly, an extensive article in *Astrophysics Journal* made the case for a cycle of 76 years of shrinking and expansion. Since then, additional papers have been published which verified the cyclical change but failed to verify the original shrinkage result.

Perhaps the most important paper, and one I alluded to in my response letter, was a 1984 report by Eddy -- one of the original authors of the shrinkage presentation -- and Frohlich. They found that, from 1967 to 1980, there was an increase in the sun's diameter equivalent to 8 feet per hour. The behavior they found is extremely consistent with a 76-year cycle.

So, the tentative paper by Eddy and Boornazian spurred more research, which ended up invalidating their results but finding new, better information. They presented a puzzle and the scientific community solved it. The data does not support long-term, rapid shrinkage of the sun. The scientific method worked!

But then came the creationists.

The puzzle presented by Eddy and Boornazian quickly was adopted by creationists as "scientific evidence" or "proof" that the Earth must be young, and therefore evolution incorrect. In 1980, Russell Akridge, a physicist at Oral Roberts University, published an article in the Institute for Creation Research's (ICR) *Impact* publication. He made two errors of assumption, and went on from there. First, he accepted, without question, the tentative results from the Eddy and Boornazian presentation. Second, he assumed, without cause, that such a shrinkage had always occurred since the sun's birth (or, as he more likely believed, the sun's creation). This assumption ignored the possibility of any sort of cycles in the sun's size.

With these assumptions, he calculated that the sun would have been twice its current size 100,000 years ago, and would have been as large as Earth's orbit 20 million years ago (both of these claims were repeated verbatim in Hedinger's letter to the editor). Akridge went on to conclude that the source of solar energy might very well not be thermonuclear fusion!

As Van Till wrote about this article, "These were bold claims, asserting the imminent collapse of a major portion of the contemporary paradigm of astrophysics. The credibility of a scientific claim, however, is established not by its boldness, but by its adequacy to account for physical phenomena in an accurate, coherent and fruitful manner." Unfortunately for Akridge, and similar to so many of his creationist cohorts, his claims don't hold up under scrutiny.

Van Till went on to say, "Though it may not have been apparent to his untrained readers, Akridge's uncritical

acceptance of a single report -- a report greeted with skepticism by the relevant professional community, a preliminary report not yet tested by comparison with other relevant studies -- represented a serious failure to perform with integrity the critical evaluation expected of professional scientists."

Once Akridge's article was in the creationist literature, it became part of their "scientific proof" against evolution, making it almost impossible to correct. Indeed, it has taken on approximately the same status as an urban legend. Thomas Barnes, then the Dean of the graduate school at the ICR, wrote an article about six "evidences" for recent creation in a 1982 Christianity Today. The list was concluded with the shrinking sun claim.

Even though Barnes' article was written after numerous scientific papers casting doubt on the original shrinking sun result, there was no evidence that he even considered these conclusions; he merely repeated Akbridge's claims. Such repetition without any interest in more up-to-date analyses showed up in other ICR material as well.

Thus, a legend was born. I have no idea where Hedinger got the misinformation about the "shrinking sun" -- whether it was an old ICR publication such as I've mentioned here, or whether there is a newer one that continues to put forth this myth as fact. It really doesn't matter, as Hedinger's letter has now only expanded the reach of the myth, at least locally. Maybe my letter helped to stem the myth a bit, maybe not. The best we can do is to keep plugging away and correcting their errors whenever we see them.

In Case You Missed It...

by Bob Ladendorf

Recent news and sources of interest, with brief summaries and a rating of the content: 1 = Pro-skeptical; 2 = Leaning skeptical; 3 = Neutral, presenting sides equally; 4 = Leaning paranormal/pseudoscientific; 5 = Pro-paranormal.

"Counter-attack (creation v evolution)." The Economist, Aug. 17, 1996, pp. 26-7 -- Brief overview of the current status of the creation/evolution debate in the schools. Selected quote: "Their [creation scientists] persistence worries Molleen Matsumura, a director of the National Center for Science Education. 'This year saw creationist legislation introduced in five states,' she says. 'None of it passed, but no doubt many teachers will avoid teaching evolution rather than cause trouble.'" Rating: 3

"Ask Marilyn." Marilyn vos Savant, Parade, Sept. 15, 1996, p. 20 -- Answers a reader's question about the Ouija board by lambasting it. "The Ouija Board is just a lot of hoey, and it scares people for nothing." To prove it's nonsense, she suggests playing it blindfolded and having friends observe what happens. Rating: 1

"Science Solves the Ancient Mysteries of the Bible." Mike Fillon. Popular Mechanics, December 1996, pp. 39-43. Presents scientific explanations for: a possible new location for Noah's Ark; Lot's wife as a pillar of salt -- literally; the parting of the Red Sea as a natural phenomenon due to a wind shift in a "reed sea"; the Star of Bethlehem as a nova star or planetary conjunctions; the Burning Bush (aka God) seen by Moses as a bush ignited by lightning in a natural gas leak; the Shroud of Turin as a hoax; and several others. Except for the Shroud of Turin, the the Lutheran author leans towards the scientific explanations for the "miracles." Illustrated. Rating: 2

"False 'recovered memory' defamation suit is settled." AP. State Journal-Register, Nov. 16, 1996, p. 8. News report about the Rutherfords' settling of a \$1 million lawsuit against a Missouri Assembly of God church and its counselor, Donna Strand, and her husband, Pastor Robert Strand, for instilling false memories of abuse of their daughter Beth. Selected quote: "Under the counselor's guidance, she [Beth] recalled how her minister father repeatedly raped her, got her pregnant, then performed a painful coat-hanger abortion. In truth, Beth was still a virgin, and her father had had a vasectomy many years before." The Rutherfords plan to use the money by touring the country to warn others about the dangers of recovered memory therapy. Rating: 2

Ongoing ... and Upcoming

Geller film needed by Randi. In the early 1970s, SRI (then known as the Stanford Research Institute) produced a short black and white 16 mm film titled Experiments with Uri Geller. James Randi is looking for a copy of it. If you have any information about the film, contact:

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A&E to show series on "unexplained." Beginning Jan. 2, 1997, the Arts and Entertainment network plans to begin a new weekly series, "The Unexplained." The first hour-long show is supposed to be on "psychic detectives," featuring Noreen Renier and the Williston, Florida, case. Source: CSICOP.

From the Editor

Bob Ladendorf

This issue features an excellent retort by our chairman, David Bloomberg, to the assertions of a creationist in a letter to the editor to Springfield's daily newspaper. David's article also should serve as a wake-up call to our readers about the need to respond to unfounded assertions in any letter to the editor of any publication. If you do not feel comfortable or informed enough about particular assertions in letters or articles you find, please forward them on to us at REALL, and we'll certainly formulate a response or forward them on to other scientific experts.

This month's issue also includes a couple new features that we hope will become regular ones. "In Case You Missed It ..." highlights an article, book, or show of interest to our readers, includes a brief summary, and rates them as to how skeptical they are about the pseudoscientific or paranormal subjects covered. "Ongoing ... and Upcoming" features announcements or schedules of important activities. We hope you enjoy them.

We at REALL look forward to seeing you at our December 15th meeting at Shakey's for open general discussion of scientific and pseudoscientific (and paranormal) matters. We also want to look forward into the new year and discuss suggestions to improve our organizational activities.

Happy Holidays!

/s/ Bob Ladendorf

From the Chairman

David Bloomberg

I had written the letter to the editor at the State Journal-Register two weeks earlier, but had given up on it getting published (see "Honey I Shrunk the Sun," page 1). Then, after I got out of the shower one morning at about 7:30, my wife told me that the answering machine woke her up. I played it and heard a rambling message from a man who didn't leave a name. This was how I found out that my letter had been printed. This is why I sometimes wish I had an unlisted phone number.

But if I want the media and other interested people to be able to contact me, I have to make the sacrifice of letting the occasional crank contact me as well. This wasn't so horrible (though my awakened wife may not have agreed), but it was a bit annoying. This man decided he could just call me up at 7:30 in the morning to tell me that I should have capitalized "pope" in my letter (I had, the SJR changed it). He went on to say that I was wrong when I wrote that the "the pope recently spoke out in favor of evolution" and that I should listen to some preacher on the radio to hear the facts. If I'd have talked to him, I'd have told him that I don't listen to radio preachers for my scientific information, thanks. But since he left neither a name nor a number, writing it here is the best I can do.

A few days later, I received mail addressed to me at my home with no return address. It contained a different letter to

the editor (from a creationist, but not the same one that I responded to about the "shrinking sun"). That's all it contained, though. No hint of who sent it to me. I tend to doubt that these two things are at all related, since I do have my home address unlisted, but who knows? If, by some chance, somebody reading this sent me the letter as information, please attach even a short note in the future so I can at least thank you.

The article I wrote about the creationist "shrinking sun" myth is a good example of the types of articles I'd be interested in seeing from REALL members inclined to write for us. The myth itself is over 10 years old, but that certainly doesn't make it "old news." If you know something about a subject that might be of interest to other REALL members, please consider writing it up for us. Just because you are familiar with it doesn't mean we all are, and it could be very interesting for the rest of us. We want to hear about it!

This month, we're having another lunch/discussion meeting at Shakey's Pizza & Buffet on Sunday, December 15 at noon. These meetings have been popular in the past, so I hope to see a lot of you there. Hopefully, the weather will cooperate.

/s/ David Bloomberg

REALLity Check

by David Bloomberg

We have a wide range of acronyms to cover this month, from EMF to FMS to OAM. So let's get to it!
Are EMFs Dangerous?

Electromagnetic fields (EMFs) from power lines and household appliances have been the subject of a great deal of debate and speculation ever since researchers reported a study showing that children living close to high-voltage power lines in Denver had a higher rate of leukemia than could be accounted for by other factors (1979). While there were numerous other studies, EMFs didn't make it to the "big time" until the late 1980s or early '90s, when various news shows picked up on the debate.

Science (11/8) reports that a National Research Council (NRC) panel, which conducted an extensive 3-year study, concluded that there is "no conclusive and consistent evidence" that the EMFs cause cancer, neurobehavioral problems, or reproductive and developmental disorders at normal exposure levels. This report was commissioned by the Department of Energy at Congress's request.

The panel did agree that very high doses of EMFs can have biological effects, such as disruption of chemical signaling between cells (in cultures), inhibition of melatonin production (in animals), and the promotion of bone healing (also in animals). But none of these effects were found at levels equivalent to those found in a home.

The committee found that epidemiological studies which supposedly linked EMFs to adult cancer and other health problems were not persuasive.

They did investigate the leukemia studies and did, indeed, find that there was a 1.5-fold increase in cancer rates in homes with a high "wire code" (estimate of household EMFs based on the distance to the power lines). However, they also found that the wire code predictions were not good indicators of the actual fields in the homes, and that there was actually no correlation between the true EMF measurements from the home and childhood leukemia. This suggests that some other factor may be at work, such as air pollution (high wire code homes apparently tend to be on streets with high traffic). For now, the actual cause of the increased risk remains unknown, but the report concluded that "The current body of evidence does not show that exposure to these fields presents a human-health hazard."

Some researchers have found the report too dismissive, and, indeed, three of the 16 members of the panel released a separate statement saying that, although they signed off on the panel's report, they wanted to point out that effects from environmental EMFs "cannot be totally discounted" and they called for more research.

So, do EMFs cause health problems or not? Right now, this report certainly seems to suggest they do not, at least at a detectable level. But as the chair of epidemiology at the Harvard School of Public Health was quoted as saying, "It's one thing to say, 'Not guilty,' and another to say, 'Innocent.'" He added that the issue of residential EMFs "will never go away."

Indeed, it may never go away, but I do want to hold out hope that any media covering it from now on will stick to the facts rather than the sensationalism that has tended to characterize what should be a solid scientific debate.

False Memory Suit Settled

The State Journal-Register (11/16) reported the settlement of a Springfield, Missouri, false memory lawsuit. Yes, these cases are still out there; they just haven't been reported as frequently as before (although the show Turning Point featured an FMS case, which I'll discuss next month).

This one stands out as a classic example of evidence finally triumphing over false accusations. Briefly, Beth Rutherford had some problems sleeping and went to see Donna Strand, a church counselor. Over the time of her sessions, as has so often happened, a simple problem took on new supposed meaning with guidance from Strand. Rutherford "remembered" her father raping her repeatedly, giving her a clothes-hanger abortion, etc. Strand informed the church (where Rutherford's father was a minister) and they forced him to resign. His world collapsed around him.

But what the elder Rutherford hadn't told the church was that he had had a vasectomy when his daughter was 4, and there was no way he could have impregnated her (I would have told them right then and there, but he said he was so outraged that he wanted to preserve some dignity). After they got Beth away from the counselor, and she underwent a gynecological exam showing that she was still a virgin, she realized that she had been the victim of false memories. She recanted fully.

The Rutherfords settled a defamation and malpractice lawsuit for \$1 million against Strand, which they plan to use to travel the country and warn others about the dangers of recovered memory therapy. Unfortunately, the terms of the settlement didn't require Strand to admit any wrongdoing.

The facts here showed that the supposed memories could not have been true. Unfortunately, not all cases of false accusations and false memories are solved so easily (though I doubt it seemed "easy" to the Rutherfords).

OAM, Oh My!

The Office of Alternative Medicine (OAM), under the National Institutes of Health, has a new director (well, he's actually been there for over a year). As I reported in an earlier "REALLity Check," the former head of the OAM resigned almost two years ago because he was being annoyed by congressmen pushing their pet projects and also because of an OAM advisory council that included people advocating unproven "cures" for cancer.

From a profile in Scientific American (October 1996), it doesn't look like the latter will be a problem for the new director, as he pushes unproven "cures" himself. In fact, when he was in medical school, he was asked to repeat a rotation after he suggested a homeopathic remedy for a patient with severe antibiotic-resistant pneumonia!

Wayne B. Jonas is the new head of the OAM, with a budget that was just increased by Congress to \$11.1 million. While he is a doctor and spent a year at the Walter Reed Army Institute of Research, he also co-authored a book, Healing with Homeopathy: The Complete Guide, which the profile's author notes "exudes an emotional depth and passion for alternative medicine."

He is supposed to get the agency on track to run a scientific research program, but the profile noted that it is unclear "whether Jonas can reconcile his commitment to running a serious research program with his personal beliefs in the merits of alternative medicine." Indeed, when he didn't like some of the questions being asked by the author, the OAM's press officer called Scientific American to ask that another writer be assigned to the story.

In his book, he did say that homeopathic effects might be due to the placebo effect. But then he also says that it might work because a patient's "unhealthy" electric field transfers to the remedy through the coupling of "biophotons." Huh?

Robert Park, a physicist at the University of Maryland, describes the OAM by saying "ancient religious practices are being dressed up with New Age technobabble." That sounds about right to me, too.

What about Jonas's stint at the Walter Reed Army Institute of Research? Didn't that teach him the proper way to do a scientific study? Well, the former supervisor where he worked said, "One year in a laboratory does not a researcher make." In addition, that supervisor and another manager at Walter Reed refused to put their names on a study that he tried to have published about a homeopathic preparation that supposedly gave immunelike protective effects in mice. The paper was rejected by three immunology journals.

The profile does note that nobody doubts Jonas's motivation. He does want to heal people, but seems to be blinded by "nostalgia for a more compassionate interaction between physician and patient," according to the profile. Indeed, this is frequently seen in alternative medicine proponents. Maybe medicine does need to be "humanized" a bit more these days. But, as the profile notes as its parting words, "whether Jonas and the OAM will be able to humanize medicine by conducting studies on vanishingly dilute solutions of elemental sulfur, poison ivy and bushmaster snake is far less certain."

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The Rational Examination Association of Lincoln Land (REALL) is a non-profit educational and scientific organization. It is dedicated to the development of rational thinking and the application of the scientific method toward claims of the paranormal and fringe-science phenomena.

REALL shall conduct research, convene meetings, publish a newsletter, and disseminate information to its members and the general public. Its primary geographic region of coverage is central Illinois.

REALL subscribes to the premise that the scientific method is the most reliable and self-correcting system for obtaining knowledge about the world and universe. REALL does not reject paranormal claims on a priori grounds, but rather is committed to objective, though critical, inquiry.

The REALL News is its official newsletter.

Membership information is provided elsewhere in this newsletter.

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