



The **BEACON**

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The Coalition for Excellence in Science and Math Education

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In this issue: President's Message—Lisa Durkin, New Mexico, the Nation and the World—Walt Murfin, Toon by Thomas—David E. Thomas, Genie Scott and CESE members—Photo by Jon Kring,

PRESIDENT'S MESSAGE

CESE: Where we have been, where we are going, and why it is important.

I want to start by thanking all who have supported CESE because what we do is important. CESE has been “Ensuring Quality Science and Math Education for All” for a long time and it is important that we continue to protect and support the integrity of science education against the onslaught of propaganda by those with an anti-science agenda.

The Current Attack on Science Education

A great deal of energy, time, and money are being used to undermine valid science and science education by science opponents, but because their efforts in the past have been failing, they have evolved new strategies. It is important now more than ever that we be vigilant.

For centuries, some element of religion has grappled with science. This is just the latest struggle in that history. Many religious people are threatened by science because it rests on a methodology of validation that includes skepticism and facts. Science deals only with evidence derived from the natural world. Religion is based on faith and a supernatural belief. Some people feel threatened by scientific ideas like evolution and birth control. Many religious people mistakenly believe that faith and fact are the same; religion is science and science is religion; and that is a major problem. What we can't seem

to communicate clearly is that science is not a threat, because on the subject of religion, science must remain silent. Science and religion are two different systems of thought that can coexist in harmony. The Clergy Letter Project (see Wikipedia) is a great example of how people of faith not only embrace scientific ideas like evolution, but are willing to sign a statement in support of quality science.

What is particularly alarming about the anti-science creationist crowd is their tendency to force a decision; they demand all people choose between belief in science and faith in God. (You are either with God or against God.) They claim that a person is not a Christian if they “believe in” scientific ideas like evolution, as if evolution were a matter of faith rather than evidence. During a visit to the Denver Museum of Natural History a creationist named Jack explained this typical stand:

“I’ve been chosen to believe in the God of the Bible,” said Jack. “Now the evolutionist has chosen not to believe in the God of the Bible. So we’ve chosen to believe they’re both matters of faith.”

Because the Bible Tells Me So?

By Brian Rooney and Melia Patria

<http://www.abcnews.go.com/Nightline/FaithMatters/story?id=4467337&page=1>

Editor's note: We urge you to read this entire article. It states that two Young Earth Creationists have operated Biblically Correct Tours since 1998, and lead 100 tours a year to the Denver Museum of Nature and Science, (see Wikipedia for details of the controversy over these tours) as well as the zoo and fossil sites, offering Creationist explanations to thousands of children and their parents. In addition, they “are now training other people around the country to hold similar tours at their local museums, and they are also putting together tour materials for Christian teachers.”

The Current Anti-Science Movement

Five major issues have cropped up in the past 12 months.

1. Answers in Genesis Museum
2. Academic Freedom Legislation—
manufacturing a controversy
3. New Creationist Text book—
Explore Evolution
4. Creationist “documentary”—
Expelled: No Intelligence Allowed
5. Current Anti-Science in New Mexico

1. Answers in Genesis Museum

This museum opened in May 2007 in Kentucky to mimic natural history museums found in cities across the nation. It

Continued on page 2

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Continued from page 1

was denounced by, among others, the Society of Vertebrate Paleontology which stated, "*The Creation Museum's fossil exhibitions, though artistically impressive, include a vast number of scientific errors, large and small. These errors range from implying that the Earth's sedimentary rocks were deposited by a single biblical Flood, to claiming that humans and dinosaurs lived alongside one another, to denouncing the reality of transitional fossils.*" They concluded with an even heavier statement, "*the Creation Museum is using the disguise of science museums and centers without including an iota of science inside.*" This is another way creationists are determined to teach our children, and it is a major problem.

<http://www.sciencedaily.com/releases/2007/07/070727210215.htm>

2. Academic Freedom Legislation

Laura Beil, in her article "Opponents of Evolution Adopting a New Strategy," explains how "Opponents of teaching evolution in a natural selection of sorts, have gradually shed those strategies that have not survived the courts. Over the last decade, creationism has given rise to 'creation science,' which became 'intelligent design,' which in 2005 was banned from the public school curriculum in Pennsylvania by a federal judge." Currently a Texas Educational Freedom Bill is before the Texas state legislature. "Now a battle looms in [Texas](#) over science textbooks that teach evolution, and the wrestle for control seizes on three words. None of them are 'creationism' or 'intelligent design' or even 'creator.' The words are 'strengths and weaknesses.' 'Strengths and weaknesses' are regular words that have now been drafted into the rhetorical arsenal of creationists," said Kathy Miller, director of the Texas Freedom Network, a group that promotes religious freedom.

The chairman of the Texas State Board of Education, Dr. Don McLeroy, a dentist in central Texas, denies that the phrase "is subterfuge for bringing in creationism." Dr. McLeroy sees the debate as being between two systems of **science**. "You've got a creationist system and a naturalist system," he said. But Dr. McLeroy says his rejection of evolution—"I just don't think it's true or it's ever happened"—is not based on religious grounds. Courts have clearly ruled that teachings of faith are not allowed in a science classroom, but when he considers the case for evolution, Dr. McLeroy says, "It's just not there. My personal religious beliefs are going to make no difference in how well our students are going to learn science," he said. Other Christians in the audience disagree; "I'm an orthodox Christian, and I don't want to say that Christianity is crazy, but science, not scripture, belongs in the classroom. To allow views that undermine evolution puts belief on the same level as scientific evidence." said Dr. Dan Foster, former chairman of the department of medicine at the University of Texas Southwestern Medical Center at Dallas.

Smoke and mirror semantics represents the latest approach to selling the creationist cause to the general public. Other sneaky phrases are: "Critically Analyze, Academic Freedom, and Allow students to evaluate and come to their own conclusions on scientific theories."

This careful wording is a way to frame the argument using popular ideals so that any opposition appears unjust, unpatriotic or immoral. This language is crafted into legislation that paves an avenue for creationist

ideas to be legally taught in the science classroom or at least sabotage quality science teaching.

Academic Freedom legislation and the accompanying language is the brain child of the Discovery Institute. The preponderance of this type of legislation is not just found in Texas. Already, legislators in a half-dozen states—Alabama, Florida, Louisiana, Michigan, Missouri, Oklahoma and South Carolina—have tried to require that classrooms be open to “views about the scientific strengths and weaknesses of Darwinian theory,”

http://www.nytimes.com/2008/06/04/us/04evolution.html?_r=2&partner=rssnyt&emc=rss&oref=slogin&oref=

3. *Explore Evolution: The Arguments for and Against Neo-Darwinism*

According to Discovery Institute; this new “textbook” seeks to improve teaching of evolution by promoting an inquiry-based approach. The Discovery Institute claims it is appropriate for high-school teachers and their classes, home schools, the general public, and college-level courses, including advanced courses in evolution, and it provides students with a rigorous college-preparatory curriculum in the life sciences that stresses critical thinking skills. *Explore Evolution* was published by Hill House Publishers, of Melbourne and London.

The lead author is Stephen C. Meyer (Ph.D., Philosophy of Science, Cambridge), who is a Program Director and Senior Fellow of the Discovery Institute. There are two microbiologists, Scott Minnich (Ph.D., Iowa State University), who is a Discovery Institute Fellow, and Ralph Seelke (Ph.D., Clemson). Paul A. Nelson is another Philosopher of Science (Ph.D., University of Chicago) and a Fellow of the Discovery Institute. May we suspect a little bias here?

Dr. Rebecca Reiss and some of her New Mexico Tech colleagues were kind enough to review this book, and she presented their conclusions in the last Beacon.

“This book is based on simplistic thinking, faulty logic, and misinterpretations of scientific literature. Accepting the explanations put forth in Explore Evolution without critical analysis insures that students will not succeed in college-level science courses. For students who have a basic understanding of the scientific method, this book provides no useful content in their quest for understanding.”

<http://www.cesame-nm.org/download/beacon/may2008beacon.pdf>

4. *Expelled: No Intelligence allowed*

In this film Ben Stein explains how 1. proponents of Intelligent Design have been unfairly treated, 2. science equals atheism and 3. Darwinism caused the Holocaust. He also explained to Pat Robertson’s 700 Club in March 2008 “*I think people want to suppress the idea of an Intelligent Designer - I call the Intelligent Designer ‘God’-because they think if there’s a God, I’m going to be held morally accountable...*”

All of these accusations are easily contested, but it is amazing how popular this manufactured controversy is for the creationists—they actually believe these allegations. I find this deeply offensive.

Beginning with the first allegation; were scientists unfairly treated? In *Expelled*, Stein explains how “Richard Sternberg was ‘terrorized’ and ‘his life was nearly ruined’ when, in 2004, as editor of Proceedings of the Biological Society of Washington, he published a pro-intelligent design article by Stephen C. Meyer.” He also contends that Carolyn Crocker was fired for daring to mention ID at George Mason University. Dave Thomas argued away these claims in the last issue of *The Beacon* (May, p.2) What would happen if a preacher started giving sermons about counter-theological ideas, at church, in support of an anti-religious agenda? Do you suppose this preacher would be treated “unfairly” by their superiors and congregants?

The second allegation is that all scientists are atheists. The fact that being an atheist doesn’t automatically make one a bad person is beside the point. What

ruins this claim is that most scientists are not atheists. Ken Miller, a Catholic biologist who sees no conflict between evolution and his faith was not invited to be interviewed. When asked why Miller was not included, producer Mark Mathis explained, “*Ken Miller would have confused the film unnecessarily.*”

The final allegation is that Darwinism caused the Holocaust. If the preceding material wasn’t offensive enough, here is what the film website has to say about this claim; “*In fact, Nazi Germany is the thread that ties everything in the movie together. Evolution leads to atheism leads to eugenics leads to Holocaust and Nazi Germany.*” Again, Dave Thomas did a superb job of dismissing this ridiculous claim in the last issue of *The Beacon*. Suffice to say that the works of Martin Luther have better ties to the holocaust than Darwin ever did.

5. *Current Anti-science Activities in New Mexico*

A member of IDnet-NM, who has a long history with opposing science in New Mexico sent a letter to New Mexico teachers in which he offers a DVD “*Investigating Evolution: A Six Part Educational Series which is designed to supplement traditional biology courses.*” He quotes the State science standards (II.2.9) “*critically analyze the data and observations supporting the conclusion that the species living on Earth today are related by descent from the ancestral one-celled organisms.*” This is a well written standard that has been twisted to serve the creationist agenda.

This IDnet-NM person also quotes the NCLB Conference Report: “*The Conferencees recognize that a quality science education should prepare students to distinguish the data and testable theories of science from religious or philosophical claims that are made in the name of science. Where topics are taught that may generate controversy (such as biological evolution), the curriculum should help students to understand the full range of scientific views that exist, why such topics may generate controversy, and how*

Continued on page 4

Continued from page 3

scientific discoveries can profoundly affect society."

Contrary to the implication, this conference report is not part of NCLB and therefore not legally binding. Please see www.millerandlevine.com/km/evol/santorum.html

Finally he quotes a Zogby Poll:

- biology teachers should teach Darwin's theory of evolution and the scientific evidence that supports it (NM 2003= 19%) (U.S. 2006 = 21%)
- biology teachers should teach Darwin's theory of evolution, but also the scientific evidence against it (NM 2003= 68%) (U.S. 2006 = 69%)
- neither/not sure (NM 2003= 13%) (U.S. 2006 = 10%)

It would seem that there is overwhelming public support for "teaching the controversy," but how reliable is The Zogby Poll? A representative of the American Institute of Physics analyzed the poll and stated: *"The Zogby poll is worthless, primarily due to the low response rate. Furthermore, there is no evidence that the data correspond to the groups to whom they are attributed. The questions are sufficiently ambiguous or leading that the interpretation given by IDnet is not appropriate."*

This was a sneaky "scientific" poll. The representative continues with, *"The conclusions stated by IDnet-NM are not supported by the poll, the poll is falsely portrayed, statistically insignificant, highly biased, and presents a completely false picture of the views of National Labs and university scientists."* These sneaky tactics are effective and that is a major problem.

<http://www.nmsr.org/id-poll.htm>

You may be wondering why no "Academic Freedom" legislation was quoted by the IDnet-NM guy. With support and testimony from CESE and others, "Academic Freedom" legislation was defeated in Santa Fe in February, 2007. But IDnet-NM promises that the 2009 New Mexico legislative session will also see bills introduced that allow students to get

both sides of the story so that parents will be assured that their religious freedom will be protected. This is where we may need your help again. Please stand by.

Meanwhile, back in our schools

US students continue to perform poorly on standardized tests, fewer and fewer students are pursuing science career tracks, and too many people continue to accept the creation story found in Genesis as "science."

Even more alarming is the data presented in a recent survey of biology teachers in America. Here are some of their alarming results:

- 25% of teachers indicated that they devoted at least one or two classroom hours to creationism or intelligent design.
- Of these 25%, nearly half agreed or strongly agreed that they teach creationism as a "valid scientific alternative to Darwinian explanations for the origin of species."

The researchers conclude, *"These findings strongly suggest that victory in the courts is not enough for the scientific community to ensure that evolution is included in high school science courses. Our study suggests that requiring all teachers to complete a course in evolutionary biology would have a substantial impact on the emphasis on evolution and its centrality in high school biology courses."*

Researchers Michael B. Berkman, Julianna Sandell Pacheco, and Eric Plutzer found and published these startling results in May. *Evolution and Creationism in America's Classrooms: A National Portrait*. See also: www.pubget.com/site/preload_results?search%5D=l8494560

CESE Goals

Given this year's accomplishments, here are my CESE goals for the next year:

- Continue to monitor Discovery Institute and other creationist activities, alert members, and take appropriate action.
- Continue to promote, and educate

people about, quality science and science education.

- Grapple with manufactured controversies created by political and religious agendas.
- Educate New Mexico science teachers and administrators about evolution science.

New Mexico Teacher Support

We need to provide teachers with materials that support quality science education. CESE has always worked on this, but this year I will be traveling around the state, and will attempt to meet with teachers and administrators personally, either as inservice or after school informally, and advocate for a pro-science agenda.

We will also continue our relationships with legislators, boards, state Public Education Department, and educators, as needed. It may not sound like much, but advocating for quality science education is a huge undertaking that is needed now more than ever.

Vision

When we look at the wealth of opportunities hovering on the horizon . . . stem cells, genomic sequencing, personalized medicine, longevity research, nanoscience, brain-machine interface, quantum computers, space technology

—we realize how crucial it is to cultivate a general public that can engage with scientific issues; there's simply no other way that as a society we will be prepared to make informed decisions on a range of issues that will shape the future.

—Brian Greene, Put a Little Science into Your Life, 2008.

Lisa Durkin
CESE President

NM, the Nation, and the World

We know that New Mexico's scores on the NAEP¹ tests lag US scores. We also know that US scores in international tests lag the scores of many other advanced nations. It would be interesting to see how NM, the US, and some of the top scoring nations compare across the entire distribution of scores. There is a method for mapping one distribution onto another. The mapping preserves the shape of the distribution being mapped. For example, suppose that a PISA² score X is at the 10th percentile of the PISA distribution and transforms to score Y in the NAEP distribution. Then Y will be also be at the 10th percentile of the NAEP distribution.

It is possible to map PISA scores onto NAEP distributions by this method. It is also possible to estimate the entire distributions in both NAEP and PISA from the reported scores at various percentiles. Those are given for both NAEP and PISA. A Beta distribution with four parameters can usually be found to fit any arbitrary distribution with small error. I have written a computer program to find the Beta distribution that makes the best fit to NAEP or PISA data.

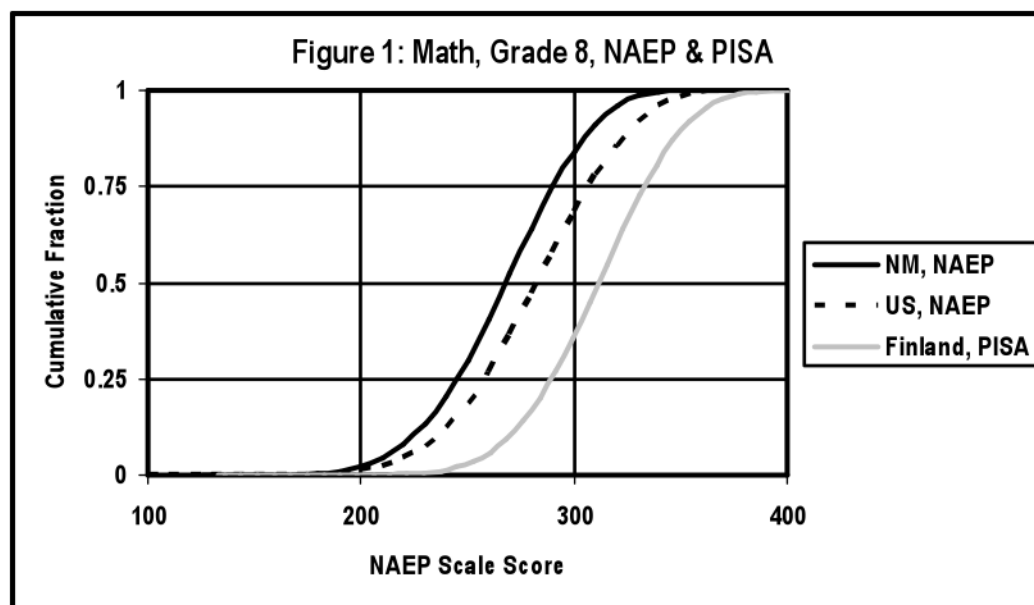
NAEP and PISA tests have not always been given in the same year. When there was a difference, I chose the tests closest to each other. Also, NAEP tested 8th graders, and PISA tested 15-year-olds, perhaps about 9th graders. The comparisons will not be perfect, but are as good as can be managed.

Figure 1 shows the distribution of NM and US NAEP math scores for 8th graders in 2007, compared with mapped PISA scores for Finnish 15-year-olds in 2006. Finland was the highest scoring OECD³ nation in math.

It is worth noting that the difference between New Mexico and national scores is small compared to the whole range of either. However, the average difference between Finnish and New Mexico students is a sizeable fraction of the spread of New Mexico scores. The scores of New Mexico's lower performing students are closer to US national scores than are the scores of higher performing students. The reverse is true for Finnish and American scores. US scores for high performers are closer to Finland's than are the scores of low performers. The score differences in the following tables are in NAEP scale score points.

Percentile	US Score Minus NM Score	Finland Score Minus US Score
10 th	11	35
90 th	19	24

US reading scores were not available for the 2006 PISA test, but were available for the 2003 PISA test. NAEP tests were also administered in 2003. Finland was again the highest scoring OECD nation. The score distributions are shown in Figure 2. Similar to the math scores, NM low performing students are closer to US students than are NM high performers, and US high performers are closer to Finnish students than are the low performers.

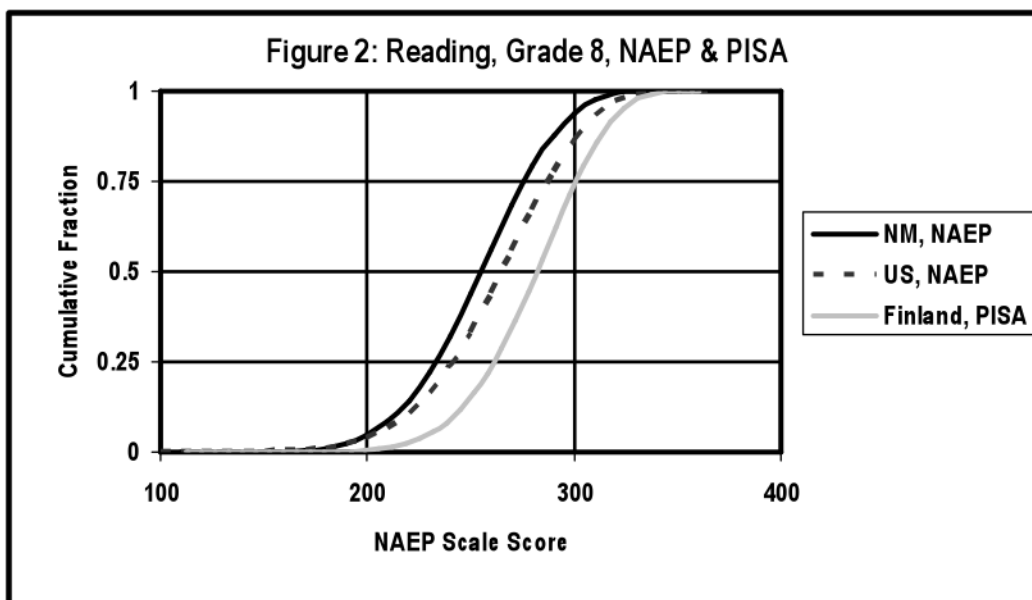


¹NAEP = National Assessment of Educational Progress

²PISA = Programme for International Student Assessment

³OECD = Organization for Economic Co-operation and Development

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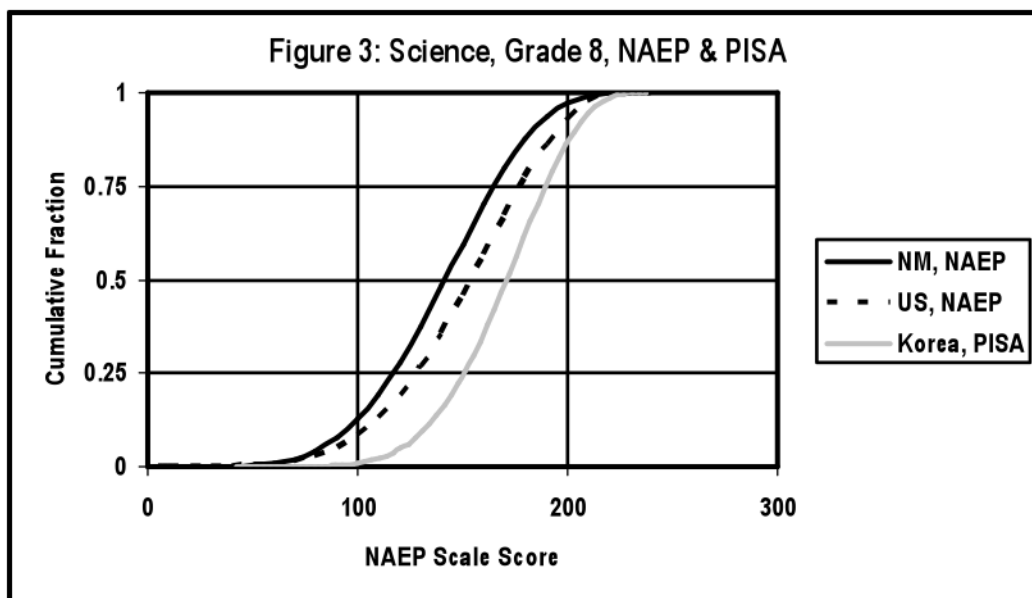


Percentile	US Score Minus NM Score	Finland Score Minus US Score
10 th	4	27
90 th	12	8

Percentile	US Score Minus NM Score	Korean Score Minus US Score
10 th	8	29
90 th	11	9

Score distributions for NAEP and PISA science in 2000 are shown in Figure 3. South Korea was the highest performer in science. The general observations are the same. The differences between groups are smaller than the range of scores

group. New Mexico's low performers are close to the US low performers. US high performers are closer to corresponding Korean students than are the US low performers.



Conclusions

For every subject, the average difference between New Mexico and national scores is small compared to the range within either one. For every subject, New Mexico high performing students lag US high performers more than low performers lag similar US students. For every subject, US low performers lag high-scoring nations' low performers more than high performers do. New Mexico's difference from the nation tends to be more severe at the high end of the scale. The US problems tend to be more severe at the low end of the scale, vis-à-vis high scoring nations. The high-scoring nations appear to have only a small

fraction of students who do better than the best US students. The US appears to have a large fraction of students who perform worse than the slowest students in the high-scoring nations do.

Walt Murfin
CESE Statistician

TOON by Thomas

"I personally think that the life, human life and the world we live in wasn't created accidentally. I do think that there's a creator. I'm a Christian. I do think that God played a role in creating not only earth, but mankind. Now, the way that he did it, I'd **certainly want my kids to be exposed to the very best science.** I don't want them to be—I don't want any facts or theories or explanations to be withheld from them because of political correctness. ..."



Bobby Jindal, Governor of Louisiana, on *Face the Nation*, June 15th, 2008

Week of June 23rd, 2008: Jindal signs SB 733, the "LA Science Education Act," into law.

"The State Board of Elementary and Secondary Education, upon request of a city, parish, or other local public school board, shall allow and assist teachers, principals, and other school administrators to create and foster an environment within public elementary and secondary schools that promotes critical thinking skills, logical analysis, and open and objective discussion of scientific theories being studied including, but not limited to, evolution, the origins of life, global warming, and human cloning."



 Pandora's Box

Pandora's Box has been opened.
How could this affect New Mexico?
Watch the next 60-day Legislative Session! (2009)



Several CESE members with Dr. Eugenie C. Scott (Executive Director of the National Center for Science Education) during her most recent Albuquerque visit, to receive another honorary degree, this time from University of New Mexico.

From left to right:

*Marvin Moss, Marshall Berman, Genie Scott, Kim Johnson, Mark Boslough, Jesse Johnson, Harry Murphy
photo by Jon Kring*

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If you are one of our loyal dues-paying members, you may not realize how far your money travels. Practically all of our income goes toward printing and mailing The Beacon, our newsletter (mostly in-state, but some out of state). The only other expenses are for maintaining our website, hiring a speaker for the annual meeting, and for State Science Fair prizes.

and House representatives, selected state Senators and Representatives and other state officials such as the Governor, Secretary of Education, and members of the Public Education Commission; some local school boards; chambers of commerce, newspapers, and a few organizations similar to CESE in other states.

We mail The Beacon, on a non-partisan basis, to persons with influence and interest in science and math education. These include our U.S. Senators

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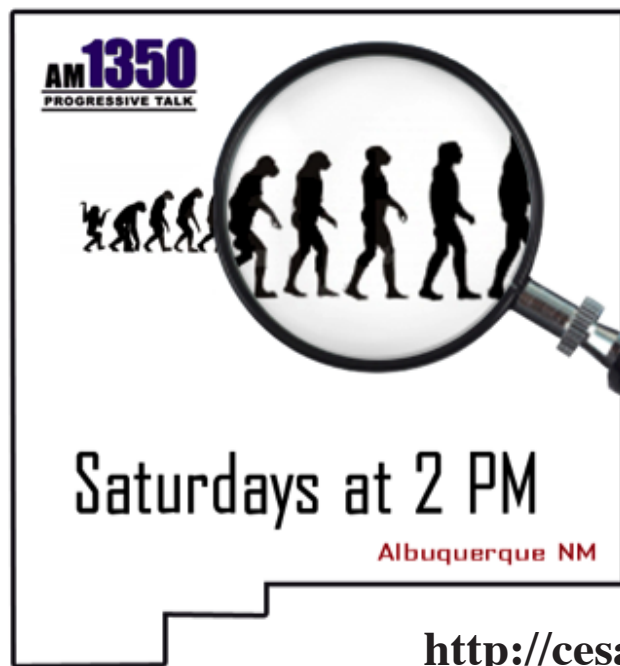
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