Science & Math CESE Education

The BEACON

News from

The Coalition for Excellence in Science and Math Education

Volume VIII, No 4

President's Message

November, 2004
Marshall Berman

I write this message as I listen to the news coverage of President Bush's reelection and the increasing Republican control of both Houses of Congress. The nation truly faces many challenges in the coming years, and education played a much smaller role in this election compared to 2000. But how many of the global and domestic challenges we face have their roots in education?

The barbarous, murderous acts of the Islamofascists have their roots in the Madrassas. These religious schools were spawned by the rigid, austere and fundamentalist form of Islam called Wahhabism, born in and heavily financed by Saudi Arabia. They are far less concerned with scholarship than with making war against infidels.

In Pakistan alone, between 1.5 and 2 million boys are attending around 20,000 of these "nurseries for radical Islam," and Pakistani officials estimate that about 10% of them have links to militant groups. (http://www.csmonitor.com/2004/0824/p01s04-wosc.html)

"These are parrots of heaven," says the young cleric at the Jama Masjid Khulfa-e-Rashadeen school. "We teach our students purely Islamic teachings to make them pure and ideal Muslims who will not hesitate to sacrifice their lives for the cause of Islam." (Christian Science Monitor, August 24, 2004)

A Palestinian psychologist claims that more than half of Palestinian children aged 6 to 11 dream of becoming suicide bombers.

In North Korea, classrooms are used to "train" students to hate America. And the children come to worship their dictator, Kim Jong Il, much as Soviet children learned to worship Joseph Stalin. And then there were the Hitler Jugend in Nazi Germany.

For much of human history, tribes and nations have recognized the importance of educating children, even when that education more closely resembled indoctrination and blind obedience.

CESE was born out of a desire to protect the integrity of science education and critical thinking for New Mexico children. And we gradually extended our mission to support excellent education for all children in all subjects. As much as the "indoctrinators" believe that children need to be molded into servants of their state or religion, we believe that children must be educated to think independently, to reason

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WWW.CESAME-NM.ORG
Dr. David Johnson Web Master

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with data and evidence, and to become the informed, literate, and numerate citizens we need to maintain our democracy and our freedoms.

We are engaged in a very noble cause. Often our opponents believe that they have a monopoly on the truth, and that their beliefs must be incorporated into our secular public schools. Sometimes they openly admit the religious basis of their goals. More recently, they mask this basis with pseudoscience and philosophy, masquerading as science. They do not waiver from their mission - and therefore neither will we.

We continue to work at the local, state and federal levels, wherever our experience and expertise can help our schools and our children. Although there is no shortage of good intentions, many policies and programs are not informed by the research, data, and analyses that have so benefited our country.

This struggle will continue as long as humans inhabit this planet. Thank you for standing up for high quality education, and for all you have done, and continue to do to achieve our mission.

Marshall Berman
CESE President

Creationism Update – THE DRUMS KEEP BEATING

As the holiday season approaches, we can expect an increasing torrent of commercials for non-essential products. Yet, the drums never stop beating for one of the most non-essential products of all, "Intelligent Design" (ID) creationism. This self-made "controversy" takes no holiday. What's new with the creationist community, in New Mexico and beyond?

IDnet "Workshops"

IDnet-NM, the New Mexico chapter of the nationally-based Intelligent Design Network, is putting on several workshops for science teachers this fall (October 23, November 6, November 20, and December 11, 2004). IDnet-NM's announcement of these workshops noted that *"The purpose of these workshops is to address the special problems teachers face when teaching biological origins in public schools and how the new Science Standards influence classroom instruction. In these workshops we will... • review the requirements of the new Science Standards; • review the basic nature of scientific inquiry with special emphasis on the principles and practices that protect the integrity of science; • examine ways in which the integrity of science can be compromised; • look at practical aspects of teaching biological evolution including micro vs macro evolution, distinction between historical and experimental sciences, and the nature of the fossil evidence; and, • introduce design concepts, look at some examples of design in nature, examine the nature of the evidence, and discuss an approach for introducing design concepts in the classroom. Format of these workshops will be lectures by well-qualified scientists and educators, videos, and lots of discussion. Teachers will be given over $50 worth of videos, teaching guides, and a workshop workbook at no charge. The workshops are for science teachers primarily with limited participation by invitation only for education officials, legislators, and visiting scientists...."*

In light of these workshops, in which ID proponents are clearly telling teachers to go ahead and teach "design concepts," it's useful to review the thought of public officials on this very question. After New Mexico's new science standards were adopted in August of 2003, the *Santa Fe New Mexican's* Diana Heil reported on August 29, 2003 that "*Board member Flora Sanchez put a stop to mixed messages, though. She clarified this point:* ***The state is not asking teachers to present all the alternatives to evolution and 'put them on an equal footing.' ..."*** And Dr. Richard Reif, science consultant for New Mexico's Public Education Department (PED), said in a July 20, 2004 letter to CESE's own Marshall Berman that ***"In no way do the science standards support the teaching of notions of intelligent design or creation science or any of its variations."*** (This letter is posted on the CESE web page, under "Standards.")

Darwin, Design and Democracy V

The national and local IDnet organizations teamed up to bring the 5th annual symposium on ID, the "Darwin, Design and Democracy V" conference, to UNM's Woodward Hall and Student Union on September 24th and 25th. The symposium featured several prominent ID "theorists," including William Dembski and Michael Behe, as well as local ID proponents. As is traditional at these conferences, one of the twenty speaking slots was an invited "Opposing View," for which I presented a talk titled "The Top Ten Myths of Intelligent Design." (A summary of this talk appears on the NMSR web site, www.nmsr.org). Both Behe and Dembski attended my talk. Neither has communicated with me to disagree with my assertion that stunning new work on star coral proteins is the last "nail in the coffin" of ID. Since the conference, *Science* magazine has permitted me to use several images from a key article article on these proteins, "Evolution of Coral Pigments Recreated," by Juan A. Ugalde, Belinda S. W. Chang, and Mikhail V. Matz,

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(*Science* 2004 305:1433, 9/3/2004), on the NMSR web site, in a piece for the layperson titled "*New Work Documents the Evolution of Irreducibly Complex Structures.*"

Presentations at Science & Math Teachers Annual Meeting

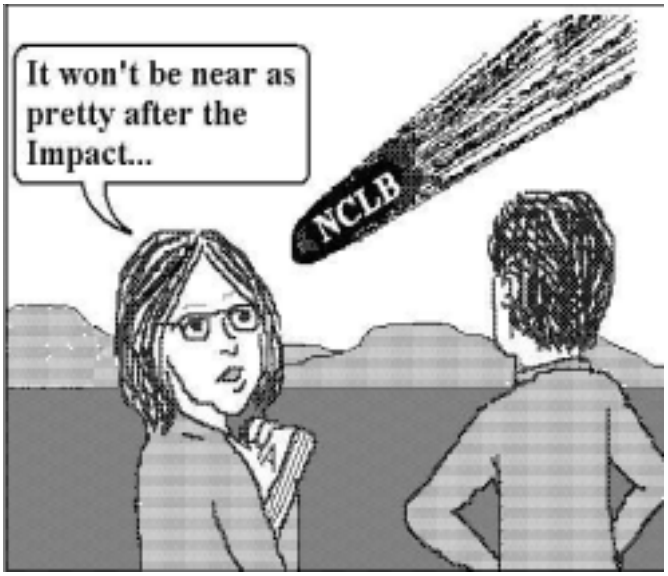
The New Mexico Council of Teachers of Mathematics (NMCTM), the New Mexico Science Teachers Association (NMSTA) and the Environmental Education Association of New Mexico (EEANM) held their annual conference, titled "Making Connections: Higher Expectations for Math, Science and Environmental Education" on November 10-12, 2004. Dr. Richard Reif of the PED made two outstanding presentations, one on the new science standards overall, and another on legal questions regarding the teaching of evolution. I also presented an updated version of my "Top 10 Myths of ID" talk. It was a great chance to connect with real teachers, hear about life down in the trenches, and get the word out about what the standards really do (and do not!) say.

Drumbeats 'Round the Nation

People in Georgia are considering the lawsuit against an anti-evolution "disclaimer" that's been in Georgia's biology books for a couple of years now. The disclaimer says "*This textbook contains material on evolution. Evolution is a theory, not a fact, regarding the origin of living things. This material should be approached with an open mind, studied carefully and critically considered.*" Readers of the Beacon will recognize the standard ploy of misdirection, in which the Georgia School Board is confusing two meanings of the word "theory"—an unsupported conjecture on one hand, versus a well-validated and developed Body of Knowledge on the other. The purpose of such disclaimers is simple: they tell the students that they don't really have to "buy into" modern science. This disclaimer makes about as much sense as requiring the following sticker to be placed on school physics books: "This textbook contains material on gravity. Gravity is a theory, not a fact, regarding the mutual attraction of objects. While some scientists warn that gravity can cause dangerous falling behavior, this assertion should be approached with an open mind, studied carefully and critically considered." The case has finished the trial phase, and is in the hands of the presiding judge. The national arm of the ID movement, Seattle's Discovery Institute, is certainly not pleased with the conduct of the trial. On Nov. 11th, Discovery Institute staff declared "'Either this attorney threw the case on purpose,' says legal analyst Seth Cooper, an expert on the legal aspects of teaching evolution, 'or he simply doesn't know what he was doing. This was a textbook case. Literally. And he blew it.' ..."

In Grantsburg, Wisconsin, the community's school district has attracted national attention after its school board approved letting creationism be taught in school. Opponents have argued that the decision is religiously motivated, and over 300 of the state's scientists have sent in letters of protest over the action.

DAVE THOMAS
CESE Boardmember



"Look Out - Here Comes 'No Child Left Behind'"
Toon by Thomas

Golden Apple – Committed to Teacher Quality

The Golden Apple Foundation of New Mexico (GAFNM), one of New Mexico's premier organizations for educational improvement, has as its core mission the improvement of the quality of education for all children through the recognition, recruitment and professional development of outstanding teachers.

Studies consistently show that the single most important factor in a child's educational achievement is the quality of the classroom teacher. In the recently released report from The Teaching Commission, Chair Louis V. Gerstner (former IBM Chair), recognized America's global leadership, then went on to note, "We will not continue to lead if we persist in viewing teaching – the profession that makes all other professions possible – as a second-rate occupation. Nothing is more vital to our future than ensuring that we attract and retain the best teachers in our public schools."

GAFNM works to improve the quality of teachers through three initiatives: Golden Apple Awards, Golden Apple Scholars Program, and Golden Apple Academy.

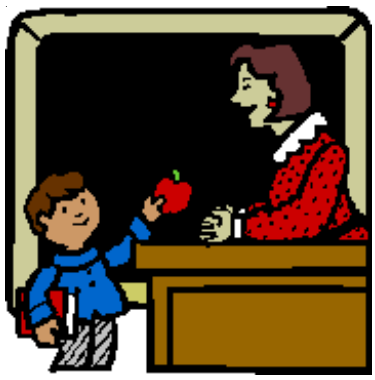
Golden Apple Awards: This program recognizes K-12 teachers from across the state for their excellence in teaching and for their commitment to the teaching profession. Over the nine years the award has been presented in New Mexico, it has grown in recognition and prestige and now ranks among the most visible teacher recognition awards in the Southwest.

Golden Apple Scholars Program: This program, begun in 2001, recruits future teachers (immediately prior to their student teaching) and provides a two-week colloquium in the summer that focuses on areas essential to new teachers making a successful transition from the university to the classroom. In 2005, the Scholars Program will expand substantially to provide just-graduated teachers a summer school teaching opportunity in a collaborative and highly supportive setting. In addition to getting new teachers off to a strong start, the Scholars program will serve more than 250 elementary and secondary students who need intensive help to bring their achievement up to grade level.

Golden Apple Academy: The Academy of Fellows includes the Golden Apple Award recipients who, as stewards of their profession have two responsibilities: (1) to utilize their insights in addressing key education issues, initiatives, and programs; and (2) to engage in ongoing professional development throughout their careers.

As a nonprofit organization, GAFNM brings funding to its mission of improving teacher quality from a variety of sources – foundations, corporate giving, and individuals. Expanding the Scholars program may draw on state funding as well. Because of the diverse sources of funding, GAFNM has many partners to the work of the organization. And individuals, through the GAFNM, have an opportunity to be a part of the mission of improving education through teacher quality.

CELIA MERRILL
Executive Director



THE PISA 2000 TESTS MAJOR RESULTS

The Organization for Economic Cooperation and Development (OECD) has a program of testing students in all OECD countries: the Programme for International Student Assessment (PISA). The tests include reading, math, and science literacy. They are different from most previous test programs because the test items are specifically aimed at real world situations. That is, in reading, ability to read is not the goal. The point of the test items is to see if students can actually apply what they have read to situations of everyday life. The same is true for math and science.

A weighted sample of 15-year old students was tested in 2000. All members of OECD and many non-member nations were tested. The emphasis that year was on reading, although math and science were included. The testing is repeated every three years; the emphasis in 2003 was on math, and in 2006 science will be emphasized.

The results from the 2000 tests are available (Knowledge and Skills for Life: First Results from the OECD Programme for International Student Assessment (PISA) 2000, OECD, 2001.) The amount of data collected was phenomenal and the amount and quality of analysis is striking .(http://www.pisa.oecd.org)

As an example of the sampling, the target population for the U.S. was about 3.8 million. A weighted sample of 3,846 students was actually tested. The sample tested translates back to a total population of 3.1 million. This says that the U. S. 15-year old school population was reasonably well covered, although not perfectly. Because of sampling, there is a standard error associated with every score, so that modest score differences have no meaning. In every country both public and private schools were sampled, as well as schools primarily slanted towards vocational training and those primarily intended to prepare for university admission. Students whose home language was different from the language of instruction were also sampled.

The United States was about in the middle in all three subjects. It should be pointed out that the majority of the highly developed countries scored higher than the U. S., and many of the countries below the U. S. were either third world or impoverished countries of Eastern Europe. We are significantly above Greece, Portugal, Latvia, Russia, Mexico, and Brazil. This is not an enviable ranking.

Many strongly held beliefs are completely overturned. For example, socio-economic status of individuals, although it influences scores to some degree, is less important than the general status of classmates attending the same school. I call this the “milieu” effect: PISA calls it the “contextual” effect. In the U. S., the milieu effect is over twice as powerful as individual status. For some countries, e.g., Germany, Austria, and Belgium, the disparity between school status effect and individual status effect is even greater. For the Scandinavian countries the milieu effect is small.*

It is commonly believed that students from poor neighborhoods do poorly because their schools are run down and lack resources. In fact, the possession of school resources has zero effect in the U. S. and only a feeble effect in OECD countries as a whole. However, the extent to which students actually use the available resources is important. It doesn’t matter how many books a school has in its library; what matters is whether the students actually use them. Students from poor neighborhoods may lack the motivation and background to delve into educational resources. The presence of educational resources and classic cultural items in the home is important. This tells us that culture rules. Students who come from an impoverished culture do not succeed, and the effect is stronger than the effect of wealth or lack of wealth.

*Editor’s Note: Walt introduced us to the milieu effect in the March 2004 issue of The Beacon with “The Kid in the Next Desk.” He’ll tell us more in the next issue.

Wealth does make a difference in the U.S. We are similar in that regard to some third world countries. In many countries wealth has only a modest effect on outcomes. In one-third of the OECD countries students in the bottom 25% by wealth had scores above the OECD average. The effects of wealth were analyzed within each country, as well as across countries. Within-country analysis tends to avoid effects of disparity between countries.

The status of parents' occupation is very important. The authors theorize that children whose parents have higher occupational status are aware of more occupational and educational opportunities and probably have higher expectations. Parental education is also important. This is especially true in countries in which birth class tends to be more permanent, that is, where upward mobility is less common. Of course, wealth and status are correlated. The common perception that poverty "causes" low performance may be mistaken. It is possible that the real "cause" is low perceived family status. We can't decide from the data we have now, but it is interesting that in the PISA data, status has a greater effect than wealth.

Teacher-related variables had only a modest effect compared to student-related variables. The perception of teacher problems that might impede learning varies from country to country. More than half report teacher absenteeism and poor teacher-student relations as problems. About half report that staff resistance to change was a problem. The student-teacher ratio has a modest but nonlinear effect. At ratios between 10 and 25 students per teacher, there is little effect on scores; this has also been found nationally and in New Mexico. At ratios above 40 students per teacher there is an effect. Very low ratios tend to be associated with small rural schools, and in most countries those schools have lower performance. This gives the curve a shallow inverted "U" shape.

There is only a small and far from significant correlation between each country's pass/fail criterion and its average PISA score. The outraged screams from politicians and the business community to "raise the bar" can be safely ignored.

The detailed analyses in PISA reinforce something that has been brought to your attention several times in this series of articles: The cause of lower performance by disadvantaged students is very complex. Many factors interact in a complicated fashion. To say that poverty, for example, is the cause of low performance is nonsense in our current state of knowledge. It has also been brought to your attention that much education research has been carried out with the express purpose of validating the contracting organization's articles of faith. We can expect a rash of papers attacking PISA because it directly contradicts many institutional belief systems.

The most painful conclusion to be drawn from PISA 2000 is that our educational system is not performing as well as systems in most other advanced nations. The fault is with us, not with the test. Let's refrain from killing the messenger.

WALT MURFIN
CESE STATISTICIAN

BANG! THERE WAS LIGHT

from HALLELUJAH EVOLUTION

Once there was nothing, no place and no timel
No gravity and no primal slime.
Then suddenly, like a lightning storm at night,
Bang! went creation, then there was light.

Chorus
Bang there was light, like dynamite,
No more nothing, no more night.
After the Big Bang, the darkness took flight
Bang, went creation, then there was light.

Nobody knows who first lit the fuse.
Some credit Yahweh, God of the Jews,
But those agnostics who doubt the Bible's right,
Just say, "S(tuff) happens. Bang there was light."

(Chorus)
After the Big Bang, events happened fast,
All of the cosmos came from the blast.
Theories are complex, abstruse and recondite,
Which means we can't say why there was light.

(Chorus)
We can't say why, but Bang! there was light.
We can't say how, butBang! there was light.
We can't say where, but Bang! there was ligt.
Fifteen billion years ago, Bang! there was light.

Membership/Dues/Donations Form

(Dues and Donations cheerfully accepted year 'round)

Coalition for Excellence in Science and Math Education (CESE)

501 C (3) non-profit, tax deductible

Member $25
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(Most of our communication is by e-mail)

Notes

Coming in the next issue of the Beacon: A first look at the results of two international tests in science, math and literacy: TIMSS-2003 (Trends in International Math and Science Study) and PISA-2003 (Program for International Student Assessment)."

Please notify Marilyn Savitt-Kring <mmkring@juno.com> if your email address changes.

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Return Service Requested

PLAN NOW!!!

Annual meeting:

Saturday, June 25, 2005, 1:00 PM
UNM Law Building

Guest Speaker: John Trever

Award Winning Syndicated cartoonist
with our own Albuquerque Journal