Science & Math CESE Education

The

BEACON

News from

The Coalition for Excellence in Science and Math Education

Volume VII, No. 5

PRESIDENT'S MESSAGE

As I write this brief message, we wait to know whether there will be a Secretary of Education, and whether New Mexico will increase the distributions from the School Permanent Fund. While there are passionate views on these two issues within our organization, there is surprisingly, and disappointingly, little passion in the general population. Yes, there have been press conferences, news articles, and public forums. But the public has often been conspicuously absent. This does not bode well for what happens after the election, because the election really settles very little.

If Amendment 1 calling for a Secretary of Education passes, we will know nothing about the duties of the Secretary or of the Education Commission that would be created simultaneously. These are to be decided in legislation. If Amendment 2 calling for increased distribution from the School Permanent Fund passes, we won't know for certain whether there will be a net increase in spending for public education. A significant portion of school funding comes from the General Fund, and this comes at the discretion of the State Legislature. Will the Legislature continue funding education at the same level from the General Fund? If this amendment fails, there will be no obvious mechanism for funding the three-tiered license, the new testing, the funds for schools requiring corrective action, and the funds for schools that show the greatest improvement. All of these reforms are now part of law and of policy. Are they funded using other schemes, such as that suggested by Patrick Lyons, the Commissioner of Public Lands, or through difficult but essential alteration of priorities? Are they simply forgotten because the Legislature doesn't find the funding?

All of the real action in education comes after September 23rd. Regardless of the outcome of the election, the voting public of New Mexico and CESE have a remarkable opportunity to shape the future of education by engaging in the public debate, by providing accurate information and insightful analysis, and by being a presence to the Legislature to assure that they do spend money on education. I urge you, the members of CESE, to stay involved after the election. It is my hope that the organization will work with other non-partisan organizations to amplify our voice so that, regardless of the outcome, we will be effective in assuring that the state makes good decisions based on good data.

Art Edwards
CESE President

(See Page 8 for election update)

The BEACON is published by the Coalition for Excellence in Science and Math Education (CESE). A 501 (c)3 nonprofit corporation, CESE is incorporated in the State of New Mexico. Visit the CESE web site.

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

CESE annual dues are $25 for individual, $35 for family, and $10 for students. Please make checks payable to CESE and mail to 11617 Snowheights Blvd. NE Albuquerque NM 87112-3157

Email submissions (subject to edit) to Editor, Nancy Shelton nshelton10@comcast.net

NEW MEXICO ADOPTS NEW SCIENCE STANDARDS

In 2002 and 2003, public school science standards came up for review. A months-long process involved educators and scientists, and even Intelligent Design (ID) advocates. The efforts of the writing team were reviewed by "mega-teams" of specialists, and public comments were encouraged and considered by the State Department of Education (SDE). SDE staffers Steve Sanchez and Sharon Dogruel were very thorough and extremely patient in their attention to suggestions by teachers, scientists, and members of the public. They were bombarded by long dialogues from ID advocates, usually containing rambling pages of complaints and suggestions to fix "dogmatic" statements. Several CESE, NMAS and NMSR members spent considerable time analyzing the standards, and suggesting possible improvements.

The SBE's Instructional Services Committee considered the final version of the standards on August 27th. At this meeting, scientists supporting the new standards outnumbered ID proponents 35-to-3. One of the six pro-science presenters was Rev. Barbara Dua, executive director of the New Mexico Conference of Churches, who told the board "There should be no fear of conflict between religion and science." Three people spoke on behalf of IDnet-NM. Three SBE members supported the standards as-is, while two members supported IDnet's modifications. The key vote was committee chair John Lankford, who had been leaning against the new standards until just before the vote. Lankford liked the latest draft, and supported the new standards, which passed the committee 4 to 2. Dr. Rebecca Keller testified that, even as an ID advocate, she approved of the new standards. The unanimous vote the next day (13-0 on Aug. 28th) was pretty much a pro-forma affair. One member commented that while he wasn't a scientist, he appreciated the fact that the scientific community (including national groups like the National Academy of Sciences, as well as local groups) took the time to review and endorse the standards.

Both the Albuquerque Tribune and the Journal endorsed the new standards in editorials. IDnet-NM's Rebecca Keller and Mike Kent also took a positive note in a Journal guest editorial on Sept. 4th, writing "Evolution will be taught as the mainstream consensus view that it is, but these standards also will allow healthy discussion and critical examination of its claims. . . ." The Creation Science Fellowship of New Mexico has also heralded

the new standards as having "radical changes challenging evolution." However, former CESE president and current NMAS president Kim Johnson has observed that knowledge of evolution will actually be tested, while knowledge of "ID" will not. "The standards are going to cause a number of teachers to actually have to learn something about evolution, and their students will be tested on it. Not as an unproven hypothesis, but as the well documented scientific theory that it is. The long-term effect of these standards is substantive toward helping our young citizens to become scientifically literate—not just in the life sciences area, but just as importantly, they are outstanding across the board. . . ."

Congratulations to all the teachers, scientists, educators and citizens who worked so hard to get New Mexico world-class science standards.

Dave Thomas

Book Review

The Man Who Found Time
By Jack Repcheck

During the Scottish Enlightenment of the late eighteenth and early nineteenth centuries, many great philosophers and scientists made Edinburgh the capital of the intellectual world for about 50 years. David Hume, one of the greatest of western philosophers and historians wrote there during this time. Adam Smith developed his ideas on economics. Joseph Smith isolated carbon dioxide and was one of the founders of modern chemistry. His erstwhile assistant, James Watt, perfected the first practical steam engine without which there would have been no industrial revolution. Not the least among these luminaries was James Hutton. Of Hutton, Stephen Jay Gould stated, "He burst the boundaries of time, thereby establishing geology's most distinctive and transforming human thought—Deep Time."

Prior to Hutton, scientists attempted to fit their geological observations into the biblical straitjacket of a six thousand year history. To do otherwise was considered blasphemy, but for one who hung out with David Hume, being accused of blasphemy held no terrors. James Hutton was a medical doctor who did not practice. At that time, a degree in medicine was the only way to obtain an education in chemistry, and chemistry, Hutton assumed, was essential to finding out how the Earth worked. He studied the Earth for many years and in 1785 he delivered a series of lectures at the Royal Society of Edinburgh (that's pronounced Edinburrah), and boldly announced that his theory dictated that the Earth was immeasurably old. From his 1788 treatise "...The result, therefore, of our present enquiry is, that we find no vestige of a beginning, - no prospect of an end." There were many skeptics of course and Hutton didn't, during his lifetime, win many of them over. He had the misfortune of bucking a trend of the time that was popular in Europe, that a "universal ocean" once blanketed the Earth creating all the formations that now existed. It was, of course, favored by the established religions because it sounded so much like the Book of Genesis.

It wasn't until Charles Lyell took up the study of geology and published "The Principles of Geology" in 1830 that the idea of a truly ancient Earth took hold. Hutton and his converted skeptic friend John Playfair provided starting points for Lyell and Charles Darwin. Without "deep time" there would not have been enough time for evolution by natural selection to occur.

The book goes into great detail about Scottish history and has colorful accounts of the Jacobin revolt of 1745 and how after the Scottish chiefs had been defeated at Culloden, the Scottish Enlightenment could really take flight. Apparently, the rule of the clan chiefs had been fairly arbitrary and there was always strife between the clans. When the clans had been finally defeated, Edinburgh had known the first period of peace and prosperity in its history. There will always be those romantic souls who wonder what would have happened if Bonnie Prince Charlie had not been routed at Culloden, but it seems as though it was all for the best.

Repcheck also goes into the history of the early Christian church and how they originally came up with the 6000 year chronology. This, of course, is a fairly familiar tale to most of us interested in the subject and used to arguing with latter day creationists.

This is a short book, approximately 200 pages, and is fairly quickly read, but it is extremely interesting and quite accessible to the layman.

Bill MacPherson

VALUE ADDED

Value-added, in the context of education, usually refers to the increment of performance attributable to a specific school or teacher. There has been a certain amount of lip service for the concept. Others have shied away from it. We hear that it's a nice idea, but we're "not ready for it yet." The fact is that the data and mathematical tools are in place today. The reluctance to make use of the tools is political, institutional, and inertial, not technical. Value-Added analysis is being used now in Tennessee and Texas.

Value-added analysis comes from the work of W. L. Sanders. An informative summary is "Value-Added Assessment: An Accountability Revolution" by J. E. Stone, at <<www.edexcellence.net/better/tchrs/16.htm>>. Sanders has developed a statistical method for blocking out pre-existing differences among students, such as race, socioeconomic status, IQ, previous education experiences, and the like. What he found is no surprise. Good teachers get good results, regardless of student quality. When student demographics are accounted for, the one overwhelmingly important factor is teacher competence. Value-added analysis looks at gains from year to year rather than static measurement. Extraordinary teachers get extraordinary gains in performance no matter at what level their students start.

Tennessee has the most experience with value-added analysis. The Tennessee Value-Added Assessment System (TVAAS) uses a modified form of the Terra Nova test, so they aren't using something out of New Mexico's reach. TVAAS rates teachers as "above the norm", "below the norm" or "not discernibly different from the norm." It would be possible in principle to amplify the ratings, for example, "exceptional" at the highest end or "unacceptable" at the low end.

It is entirely possible to develop something specific for New Mexico. As an example, schools could be nested within districts, teachers within schools, and students nested under teachers. The relevant variables would be added at each level of nesting. We could label districts as rural, urban, or mixed and look at district size and the average education level of people in the district. For schools we could include size, physical resources, degree of community support, and student mobility. For students we could include ethnicity, parents' education, economic status, stability of past schooling, English deficit, and the like. A teacher of disadvantaged students in a poorly equipped school in a difficult district who **still** managed to instill above average growth should be eligible for exceptional status and a major pay increase.

There are some problems to deal with. There are variables outside the school system ("exogenous" variables) that could affect education in any one year. Examples might be economic turmoil or natural disasters. Theoretically, exogenous variables could be included, although they are very hard to quantify. The TVAAS uses three-year rolling averages to get around this. The idea is that over three years, good and bad outside events probably cancel out. Also, a teacher should not necessarily be rewarded for a single good year or punished for a single bad year.

Many teachers in elementary schools have the same children most of the day. Value-added analysis would be simple for them. It's a little harder to see for many middle and high schools. It isn't too hard to deal with upper grades for tested subjects that have an identified teacher. It's a problem for teachers whose subjects don't get tested. How do they get rewarded? Art, music, and physical education instructors ought to be able to reap the same rewards as math, science, or social studies teachers. Some tested subjects, like reading, might not have an identifiable single teacher in upper grades. These are problems that need to be explored, but they are not insoluble.

Individual students' scores were not available to me so I could not compute value-added by teachers. However, I analyzed value-added by APS elementary schools in math. It is not certain that a school's 4th grade students in 2002

were precisely the same children as the 3rd graders in 2001, so the analysis is only useful to see how the method could be used. Value-added between 2001 and 2002 was not strongly determined by ethnicity, English deficit, or special education. Although Hispanic and Indian students generally have lower scores than Anglos, value-added was about the same for all races. Hispanic and Indian students in APS had slightly higher value-added than Anglos in elementary school, but were lower in middle school. Those effects were not very important. The table below shows some sample results. The second and third columns show the increase in math scale scores, adjusted for student demographics, from 2001 to 2002: for example, from 3rd grade in 2001 to 4th grade in 2002.

School	3rd to 4th Grade	4th to 5th Grade
APS	14.5	10.8
School A	7.6	8.9
School B	26.5	12.0
School C	26.0	4.0
School D	7.3	22.4
School E	0.6	18.3
School F	18.3	20.5
School G	-3.9	3.4

School A had nearly equal adjusted value-added for both grades. Schools B and C added greater value from 3rd to 4th grade than from 4th to 5th grade. Something was being done well in the 4th grade in 2002, but not as well in 5th grade. Schools D and E added greater value from 4th to 5th than from 3rd to 4th. School F had very low mean scores, but had a large adjusted value-added. The increases at this school were above APS and national averages. Students at this school started with a handicap but gained more than average, indicating that something was being done right. Conversely, some schools, like school G, had high mean scores but had low adjusted value-added. This is not altogether surprising. If students start far behind, there is more room for improvement. Good teaching can help them, even if they still do not catch up to students that started far ahead. There were also some schools with low scores and low value-added. This clearly indicates a problem that needs to be addressed. Of course, the change in scores over a single year is not entirely meaningful. If the data had been available to me, the same analysis could have been done for individual teachers.

Many politicians, administrators, and school boards have reservations about Sander's analyses. Not many understand ordinary least-squares multiple regression. Some have difficulty grasping elementary statistics, and are even more confused by methods an order of magnitude more complex. National union leaders have very cautiously endorsed the concept. Teachers in the trenches have mixed views. It would be natural that some would fear the method might work against them, and the complexity of the method probably increases their suspicion. There would be little possibility of getting wholehearted rank-and-file support without a tie to really attractive pay increments. It is likely that tenure systems would need to be modified to be able to deal effectively with teachers consistently below the norm.

All the required data are already in place. We collect information on race, poverty status, English language deficit, and special education status of students. Some schools and districts have not been consistently thorough about recording the data. That could change if everyone understood that sizeable rewards would be tied to accurate data. Census data could give us lots of socioeconomic information for districts. A school's physical resources could be quantified. We already know the average national and statewide growth in Terra Nova scores from grade to grade. Dr. Sanders would probably be happy to sell his computer methods. We couldn't do it immediately, but it might be possible to start in a couple of years. It would mean ***real*** accountability. With value-added analysis, testing could become a tool to improve education, not merely to measure it. Unfortunately, value-added is probably not completely compatible with NCLB.

Walt Murfin
CESE statistician

Committee for the Scientific Investigation of Claims of the Paranormal

CSICOP Conference HOAXES, MYTHS & MANIAS

Radisson Hotel and Conference Center
Albuquerque, New Mexico
OCTOBER 23–26,2003

THURSDAY, OCTOBER 23

Registration 12:00 n to 9:00 pm Sandia Tour is filled. (Note: Hotel check-in time is 3 pm.)
Reception 6:00 pm–7:00 pm Reception is in Bld #2, 2nd floor (Cash Bar Available)

Welcoming Remarks	**Kendrick Frazier**, Editor, Skeptical Inquirer	7–7:30 pm
Would You Believe It?	Barry Beyerstein, Simon Fraser University	7:30–8:30 pm
The Psychology of the Con	Ray Hyman, Professor Emeritus, University of Oregon	8:30–9:30 pm

FRIDAY, OCTOBER 24

Registration 8:00 am–5:00 pm

Internet and Media Hoaxes	Alex Boese, Curator, The Museum of Hoaxes (online)	9–10 am
Conspiracy Theories	Jonathan Vankin, Author, 70 Greatest Conspiracies . . .	10–11 am
Pranks, Frauds, and Hoaxes. . . .	Robert T. Carroll, Dept. of Philosophy at Sacramento City College	11–12 n

Special Luncheon Presentation ($25.00 Additional Registration Fee)

Legends and Hoaxes of Evolution	Eugenie Scott, Dir., Natl. Ctr. for Science Education	12n–2 pm
Investigating Among the Spirits	Joe Nickell CSICOP Senior Research Fellow	2–3 pm
They See Dead People, or Do They?	James Underdown, Exec. Dir., Ctr for Inquiry-West.	3–4 pm
How to Hoax a Ghost Video	Mark Manning, Dir, American Assn. for Critial Scientific. . . .	4-5 pm
Dinner Break (Friday's dinner is on your own)		5-7 pm
Urban Legends: Too Good to be True	Jan Harold Brunvand, Prof. Emeritus University of Utah,	7–9 pm

SATURDAY, OCTOBER 25

Registration 8:00 am–5:00 pm

The Museum of Unworkable Devices	Donald Simanek Prof. Emer., Lockhaven University	9-10 am
The Promise of Free Energy	Eric Krieg Pres. Philadelphia Assn. for Critical Thinking	10–11 am
Beyond the Bible Code:Hidden Messages Everywhere	**Dave Thomas**, President NMSR	11–12 noon

Special Luncheon Presentation $25.00 Additional Registration Fee

The Future of Skepticism	CSICOP Staff Members	12 n–2 pm
Planet (hoa)X	Philo Plait, Astronomer & Educator at Sonoma State University	2-3 pm
Medical Hoaxes	Wallace Sampson, Clin. Med. Prof. Stanford State School of Medicine	3–4 pm
The Use of the Polygraph	**Alan Zelicoff,** Physician & Physicist; Sandia National Labs	4–5 pm
Reception (Cash bar available)		6-7 pm

Conference Banquet $40.00 Additional Registration Fee
Entertainment by BANACHEK Steve Shaw aka Banachek, the World's #1 Thought Reader 7–10 pm

SUNDAY, OCTOBER 26

Hoaxes, Myths & Monsters	Benjamin Radford, Managing Editor, Skeptical Inquirer,	9-10 am
There Were Giants In the Earth	Kenneth Feder, Dept.of Anthropology, Cent.Conn.State Univ	10-11 am
UFO's - A Space Age Mythology	James McGaha, Director of the Grasslands Observatory	11-12 n
ROSWELL Bus Trip $45.00 Additional Registration Fee	(Approximately 3-1/2 hours one way)	12 n

– Running Commentary **Dave Thomas**, Physicist, Mathematician & Pres. New Mexicans for Science and Reason
Boxed Lunch available on bus
Lavatory on bus

Bus will be picking up registrants, promptly at 12:00 noon, at the front entrance of the Radisson Hotel. This tour is limited in seating. We recommend reserving your seat early.

Conference fee—$159. adult, $79 student (with student ID)

(See Page 8 for more info)

Toon by Thomas

"Baghdad Bob" Gets a New Job...

'Toonist Comment: New Mexico IDers and Creationists lobbied for months to make newly-adopted school science standards less "dogmatic" regarding evolution. Their suggestions were NOT included in the final draft of the new standards. However, now they are claiming "victory" in their assault on evolution. The headlines above are all real - Albuquerque Journal (Aug. 29th, 2003), Santa Fe New Mexican (Aug. 29th, 2003), Albuquerque Tribune (Aug. 14th, 2003). The statement inside asterisks (*) was made by Rebecca Keller and Michael Kent of IDnet-NM, in an op-ed titled "Schools' Science Standards Will Serve Students Well," published in the Albuquerque Journal on Sept. 4th, 2003. The statement by Creation Science Fellowship of NM was made on their website on Sept. 12th, 2003.

David E. Thomas

Coalition for Excellence in Science and Math Education
11617 Snowheights Blvd NE
Albuquerque, NM 87112-3157

Return Service Requested

(from page 1)

Election update

Amendment One did pass. Governor Richardson has appointed a 31-member search committee to recommend candidates for the position of State Secretary of Education. The governor hopes the search committee will finish its work in time for his final selection to be confirmed during the special session of the legislature scheduled October 27 (to consider tax reform).

Amendment Two is another matter. The outcome has been "too close to call" since election night. A headline on the front page of the *Albuquerque Journal* Friday September 26 says, "800 Votes Not Yet Counted." The story goes on, ". . . county canvassing could continue until Oct. 3, and the statewide canvass—or audit—does not come until Oct. 14."

CESE is not predicting a winner. Furthermore, state law is unclear about recounts in elections on constitutional amendments. No predictions on that outcome either.

However, CESE still stands ready to help smooth the transition to the new form of educational governance.

Jerry Shelton

from page 6

CSICOP Conference

For more information call or write Barry Karr at

CSICOP
PO Box 703,
Amherst, NY 14226

(716) 636-1425 ext 217

e-mail: skeptinq@aol.com