



The **BEACON**

News from

The Coalition for Excellence in Science and Math Education

Volume VIII, No.2

Copyright © June 2004

In this issue: **President's Report**—Dr. Marshall Berman, **Book Report**—Bill MacPherson, **Cartoon**—Sid Harris, **Charter School News**—Bill MacPherson and Jerry Shelton, **Real Scores**—Walt Murfin, **CESE Needs Your Help**—David Johnson, **Annual Meeting Info**

President's Message May, 2004

CESE has continued to strenuously pursue our mission of “improving science and math education and science literacy for all citizens.” We and many other organizations and individuals succeeded in getting an excellent set of science standards approved by the State Board of Education. Districts are now developing curricula and supporting training for K-12 science teachers to bring these standards to life in New Mexico classrooms.

In support of these efforts, CESE together with New Mexicans for Science and Reason, organized and conducted a science teachers workshop called “How Will New Mexico’s New Science Standards Affect the Teaching of Evolution?” Presenters covered the gamut from representatives from the current and past State Department of Education (Dr. Richard Reif, Dr. Steve Sanchez, Sharon Dogruel) to the classroom (Lisa Durkin), including Prof Timothy Moy from UNM and David Thomas, NMSR president and CESE Board member. Susie Gran from the *Albuquerque Tribune* reported on this workshop: http://www.abqtrib.com/archives/news04/041504_news_evolve.shtml.

About 45 teachers and citizens attended the workshop. All the presentations and many of the handouts are available on the NMSR [<http://www.nmsr.org/workshop.htm>] and CESE

[<http://www.cesame-nm.org/workshop.html>] websites. In addition, several handouts and two excellent books on “Teaching About Evolution and the Nature of Science” were distributed. [Additional copies of these materials are available from me or Dave Thomas, and on the NAS and NSTA websites.]

As anticipated, the Intelligent Design people conducted their own ID workshop entitled “Workshop on the teaching of biological origins in public education” on May 1st at the Best Western Inn. The three speakers included Joe Renick (IDnet-NM), David Keller (UNM) and Mike Kent (IDnet-NM). About 12 people were there, including the speakers and several skeptics.

Renick discussed the ID strategy on the standards process: Initially participate on an individual basis, establish credibility, emphasize the integrity of science, and don’t promote Creationism or Intelligent Design. Then at a later time, participate as IDnet-NM and focus on language changes in evolution.

Keller claimed that ID is not creationism, but a philosophical case against Naturalism, a new scientific paradigm for historical sciences, an effort to protect the integrity of science, and to keep “religion” out of the classroom. He listed the key ID people and their books. He said that the evidence seems to point toward design.

Continued on page 2

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

BOARD OF DIRECTORS
PRESIDENT

Dr. Marshall Berman
(505) 296-5640
mberman60@earthlink.net

VICE PRESIDENT/PRES. ELECT
(Vacant)

SECRETARY
Marilyn Savitt-Kring
(505) 856-6654
mmkring@juno.com

TREASURER
Jerry Shelton
(505) 296-1467
jshelton101@comcast.net

PAST PRESIDENT
Bill MacPherson
(505) 856-6241
wmacpherson3@comcast.net

MEMBERS AT LARGE
Steve Brugge
(505) 271-9273 (H)
(505) 292-2350 (W)
brugge@aps.edu

M. Kim Johnson
(505) 897-3364 (H)
(505) 247-9660 (W)
kimber@comcast.net

Dr. Timothy Moy
(505) 254-8991
(505) 277-7851
tdmoy@unm.edu

Dr. Matt Nyman
(505) 266-5984
mwnyman@unm.edu

David E. Thomas
(505) 869-9250 (H)
(505) 247-9660 (W)
nmsrdave@swcp.com

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

Continued from page 1

Kent talked about the nature of science, distinguishing science from naturalistic philosophy, and protecting the integrity of science. He continually equated philosophical naturalism with methodological naturalism. He also argued that embryology disproves evolution, and gave a strange argument on top-down versus bottom-up evolution. He said that “Darwinism” does not fit the fossil record. He also repeated the argument that microevolution is a fact, but macroevolution is dogma. He was unable to answer a simple question as to where the “wall” between micro- and macro-evolution occurred – at the species, genus, family, order, class, or phylum. It is certain that the ID people will continue to conduct “workshops” and pursue their non-scientific advocacy in public schools rather than in science journals.

Indeed, intelligent design “theory” might be more readily accepted by the science community if it provided some model, hypothesis, or theory that was more detailed than “the designer (God) did it.” It might also be taken more seriously if it did not deliberately confuse philosophical and methodological naturalism, disingenuously claim to defend scientific integrity, hide their obvious religious bias, distort the fossil record, and defend “new” mathematical and physical concepts that have been repeatedly refuted (e.g., irreducible complexity, complex specified information, and similar invented, unproven, and already falsified arguments). ID currently is based on philosophy and religion, despite their repeated denials. “Deus ex machina” is simply not a *scientific* theory.

On the national front, the ID movement continued their assault on evolution with a victory in Ohio that produced elements of an ID-based curriculum component (<http://www.marionstar.com/news/stories/20040412/opinion/220445.html>). However, a recent election in Montana [<http://www.ravalline.com/articles/2004/05/07/news/znews02.txt>] appears to have produced two new Board members who favor teaching real science. In Italy, an attempt to cease teaching evolution in primary schools also appears to have

been thwarted as a result of strong opposition by thousands of Italian scientists and citizens. (<http://www.biomedcentral.com/news/20040429/01>).

See you June 13th at the **Annual Meeting. (See page 10.)**
Marshall Berman

Book Report



Creationism's Trojan Horse, The Wedge of Intelligent Design, by Barbara Forrest and Paul R Gross is 315 pages of densely spaced, intellectually challenging information about the Intelligent Design movement's strategy known as *The Wedge*. This icon was used, I feel certain, by the ID movement to mimic the description of the introduction of new species used by Charles Darwin himself in *The Origin of Species*. They hope that ID will become as important a scientific idea as evolution. Of course it won't, because it isn't science. Scientists recognize this fact, but laymen, being innocent of true science, and being generally fair-minded, frequently allow ID an equal seat at the table of Education. They do this because the ID people have convinced a large number of lay people that ID is real science, by dressing their philosophy in pseudo-scientific language. As Dr.

Adrian Melott of the Kansas Citizens for Science put it, ID is nothing but Creationism in a cheap tuxedo.

Forrest and Gross detail the history of the Wedge movement and its founding. The birth of Intelligent Design can be traced back to the mid-life crisis of Phillip Johnson, a Berkeley law professor. He too was innocent of true science, but felt that science was unduly under the sway of Naturalism, a philosophy that states that natural laws are all there is and there basically is no room for the supernatural, which implies, at least to Johnson, that scientists must be atheists. His whole argument is that science must "make room for the supernatural." So, in 1991 he wrote his first book on Intelligent Design, although the term didn't come into existence until later, called "*Darwin on Trial*." It was clear just from the title, that Johnson knew a lot more about argumentation than he knew about science. Science is, of course governed by methodological naturalism. A natural phenomenon must have a natural explanation, or you wouldn't be able to draw any conclusions at all or be able to make predictions about the phenomenon. This is the bedrock of science, so you can see why mainstream scientists scoff at ID and refuse to take it seriously.

The next big step was the establishment of the Center for

the Renewal of Science and Culture (CRSC) with all the big names of ID as "Fellows" of the Center. The CRSC formed under the auspices of the Discovery Institute, a conservative Seattle think tank. The first credentialed people to sign on to Johnson's jihad were Michael Behe, Stephen Meyer, William Dembski and Jonathan Wells. It should be noted, and Forrest and Gross point this out many times, that during its entire nine-year existence the CRSC has not produced a single piece of mainstream, peer reviewed science.

The authors present many arguments from the mainstream literature to counter the claims of the new creationists, and many of the points they cover will be familiar to those of you who have followed this controversy over the last few years. To recap: Irreducible complexity isn't; the Icons of Evolution grossly distorts; and the idea of "Conservation of Information" is nothing but the old creationist chestnut about how evolution violates the Second Law of Thermodynamics, dressed up in new and confusing language. The main point of *Creationism's Trojan Horse* is that the Wedge proponents, being funded by conservative religious extremists, are not really interested in having their scientific ideas taken seriously by scientists, but bamboozling school boards into getting religion back into public school classrooms. In so doing they

Continued on page 4

feel they will be the leading edge of a revolution to turn this country into a theocracy. Does that sound extreme? Forrest and Gross give a detailed description of the overtly religious organizations that support the Wedge and what their mission statements read like. The most generous of the CRSC contributors are as follows:

a) The Stewardship Foundation. According to the Foundation's history, "The Stewardship Foundation was created in 1962 by C. Davis Weyerhauser (the lumber magnate)...to contribute to the propagation of the Christian Gospel by evangelical and missionary work and to teach the Christian faith as laid down in the Old and New Testaments of the Holy Scriptures"

b) The Maclellan Foundation. From the mission statement: "The purpose of the Maclellan Foundation is to serve strategic international and national organizations committed to furthering the Kingdom of Christ and select local organizations which foster the spiritual welfare of the community. We will serve by providing financial and leadership resources to extend the Kingdom of God in accordance with the Great Commission" Maclellan's evangelical mission clearly includes opposing evolution and the Maclellan money was given to the Discovery Institute with the understanding that "...researchers would prove that evolution was not the process by which we were created"

c) Howard Fieldstead Ahmanson/Fieldstead & Company. Phillip Johnson dedicated "Defeating Darwinism by Opening Minds" to Howard and Roberta Ahmanson. Characteristic of Ahmanson's interests is his support of the Chalcedon Foundation of R. J. Rushdoony which is an extreme rightist Christian Reconstructionist organization. There was an interesting recent article about Ahmanson in Salon magazine titled "Avenging angel of the religious right."

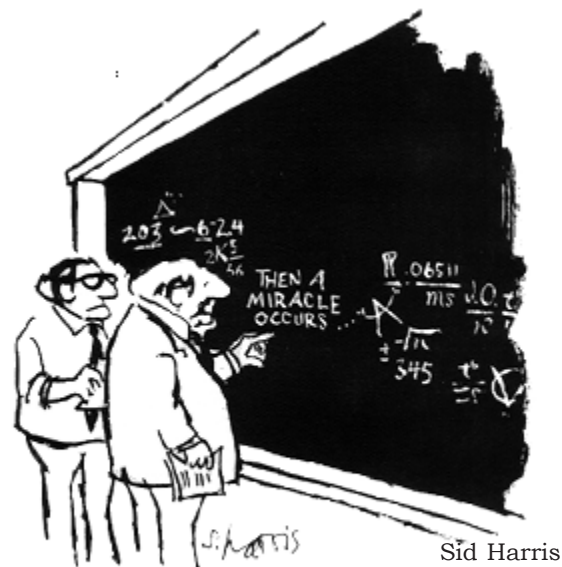
There are many religious connections to the Wedge. As a matter of fact, "God's mathemati-

cian," William Dembski, apparently belongs to no known secular professional organizations. He seeks mainstream recognition and approval but belongs to no mainstream secular academic or professional societies. He does however belong to about a dozen organizations with strong religious components.

The Wedge itself has a number of religious connections and alliances and no connections to scientific organizations. We can hope that if the court case that the Wedge proponents fervently desire finally comes to pass, this paradox will be fully explored. This organization that pretends to scientific credibility, and supposedly has only a limited connection to religion, actually has many friends in the extreme right wing of the religious community, but no friends in the mainstream scientific community .

The book was an effort to finish due to its dense nature, but reading it was well worth the time. I recommend it to anyone who does not know about the religious connections of the Wedge. but no friends in the extreme right wing

Bill MacPherson



"I think you should be more explicit here in step two."

Reprinted with permission

CHARTER SCHOOL NEWS

Two years ago we reported on a Charter School Forum (The Beacon, Vol V, No. 3 – available at www.cesame-nm.org). In one part of the forum, three speakers described their experiences setting up and operating charters in California and Delaware. At that time New Mexico had twelve charters operating (seven in Albuquerque) and more in development. Since then, many more have opened.

CESE believes that decisions should be based on data. In education however, data are often hard to come by. Charter schools can provide useful experimental data about education methods by providing test beds for different ideas.

One of us recently met with Horizon Academies' Executive Director, Michael Martin, and became acquainted with the first of their three charter schools. This provided an interesting opportunity to observe an experiment. When Horizon opened two more charters (bringing total enrollment to about 1400 students) it was clear that these folks were not amateurs.

Organizing and Financing

Michael Martin has over ten years experience with education management organizations, having helped set up charters in nearly a dozen other states. According to the US Charter Schools website <http://www.uscharterschools.org>, 41 of our 50 states plus the District of Columbia and Puerto Rico have charter school laws, and all but four of those do in fact have charter schools (in these four, the laws are considered so restrictive they have discouraged implementation.) New Mexico now has 36 charters in operation, including 17 in the Albuquerque School District, serving 3500 students. More are in various stages of the approval process (See <http://www.sde.state.nm.us/div/learn.serv/alt.ed/charter/> for more details.)

Considerable planning is required before beginning the process of seeking final bureaucratic

approvals; buying, leasing or building suitable space (usually including a health-department-approved kitchen to provide lunches for Title I kids); recruiting teachers; recruiting students; etc. Martin says, "It's exciting to be part of change. It's a creative building process, rather than a maintenance process. That's what makes it fun and exciting to get up every morning." This "freedom" appeals to some career-minded educators. Color them dedicated.

How are charters financed? In New Mexico, about \$3000 per school year follows each student to whatever public school he/she enrolls in. This provides for overhead such as salaries, books, maintenance and operating costs, etc.

However, for charter schools, the \$3000 per student must also cover the costs of providing a building. New Mexico's law complicates this part of the process, since public schools may not borrow money (remember, charters *are* public schools). This fact disallows charters from forming a relationship with a commercial/private lender since the charter is not a legal entity. Furthermore, because charters are relatively new in New Mexico, bankers have little experience dealing with them. Horizon's solution, which is typical, was to form a non-profit foundation to act as intermediary.

After Horizon's expenses are covered, the remaining "discretionary funds," roughly \$400 per student, go toward supporting their infrastructure of computer servers, curriculum servers, etc. In order to achieve economies of scale for this vital part of the business plan, Horizon needs about 500 students in each of their schools. (Other schools, with different plans, can operate with fewer students.)

Some federal money is available for charter start-ups. But the possible loss of almost a half-million dollars of such funding (\$150,000 in each of three years) for Horizon's proposed new high school was part of the reason disagreements with the APS Board were recently

Continued on page 6

Continued from page 5

causing heartburn for Horizon. This potential conflict clarifies how charters might sometimes feel harassed, whether justified or not.

In some states charters are sponsored by universities, community colleges, or independent boards. And many states allow formation of Local Education Agencies (LEAs), which sponsor the charter school, approved by the state rather than locally. (APS is an LEA.) LEAs can apply for grants, without the local board's approval.

The burden of negotiations described above, is part of the reason Horizon has adopted a system of "co-principals" for each school. One is responsible only for what goes on in the classrooms and other school buildings; the other deals with the outside world.

Modus Operandi in the Schoolhouse

In an editorial by Mort Zuckerman in the November 24, 2003 issue of *U.S. News & World Report*, he said, "What can schools do? Instill a 'culture of success' in learning. Place a high expectation on learning. Ask for sacrifices by parents and students to meet these expectations. Emphasize a content-rich curriculum taught by carefully selected and trained teachers. Stress traditional values like morals, responsibility, and respect for authority. Impose rules requiring students to dress neatly,

arrive on time, pay attention, and avoid fighting and foul language." These words describe Horizon's approach.

Horizon teaches grades Kindergarten through 8th, and is the only charter in Albuquerque to include the lower grades. Each student in third grade and above is provided a laptop computer. A typical class at Horizon consists of a "generic" lecture by the teacher, after which each student turns to his/her laptop and proceeds at his /her own pace with a wealth and variety of material available from a central server. This system provides a highly individualized program of instruction tailored to each student.

Results from standardized tests will soon demonstrate how well Horizon's students are learning. There seems to be a fairly common perception that charters will attract the "cream of the crop" among students away from traditional public schools. There may, of course, be some truth to this, but more than 50% of students at each of Horizon's three schools qualify for Title I (free lunch). Furthermore, Horizon is enthusiastic about accepting the challenge of taking on the most needy students.

Recent Developments

Charter schools were much in the news earlier this year, partly because of the charter application of Math, Science

and Technology High School (MAST) initially promoted by Albuquerque mayor Martin Chavez. MAST was eventually approved by the APS board, as was Horizon's high school. It is worth noting that our state charter school law requires that students be selected by lottery from the pool of applicants.

A January 15, 2004 editorial in the *Albuquerque Journal*, titled "Free Charter Schools From Yoke of Districts" said, "Charter Schools take per-student state funding away from districts and give them administrative headaches in return." How this will be sorted out is not yet clear, however it appears that State Secretary of Education, Dr. Veronica Garcia, is a champion of charters.

A comprehensive article about Horizon, beginning on the front page, appeared in the February 18, 2004 issue of the *Albuquerque Tribune*.

More than two years ago, in another effort to promote math and science, the Math, Science & Technology Partnership (MSTP) began operating in "clusters" of elementary and middle schools surrounding Sandia and West Mesa High Schools. See their 100-page five-year plan plus a lot more at <http://www.mstpartnership.com>.

**Bill MacPherson and
Jerry Shelton**

What Are The Real Scores?

APS and the state have typically given TerraNova scores as percentiles. When these are reported in the press, it is always said that the 50th percentile corresponds to the “national average.” The state as a whole is usually at about the 50th percentile; districts range from about the 25th to about the 80th percentiles. APS is usually about the 55th to 60th percentile. Individual schools in APS range from about the 30th to the 85th percentiles.

NAEP tests always show that New Mexico scores far below the national average. How can the state be at the national average on TerraNova and far below the national average on NAEP? NAEP tests have been called the “gold standard.” If that is so, is there something wrong with TerraNova? Let’s see how NAEP and TerraNova results compare for several states that have participated in NAEP and also report TerraNova percentiles.

First, we have to find percentiles corresponding to NAEP scale scores so we can compare percentiles to percentiles. NAEP usually reports scale scores for percentiles 10, 25, 50, 75, and 90. I made mathematical fits for the distributions corresponding to these percentiles. Next, I found the national percentiles corresponding to each state’s NAEP

mean scale score and compared that to the reported TerraNova percentile. Percentiles are not linear functions of scale scores; normal curve equivalent (NCE) scores are very nearly linear. We can find NCEs corresponding to the TerraNova and NAEP percentiles, as shown in Figure 1. The dashed line represents equal values for both tests. States that score very low – New Mexico and Mississippi – are far from the dashed line. North Dakota scores above the national average and is closer to the dashed line. It appears likely that TerraNova and NAEP scores would be equivalent at values corresponding to about the 75th percentile.

The TerraNova test has been given in New Mexico for many years. Every teacher knows what areas will be covered. There are consequences for low performance on the TerraNova. It is no secret that focused instruction takes place – “teaching to the test.” The motivation to prepare for

the test is higher for states in which performance is expected to be poor. On the other hand, if you expect to reach the 75th percentile or higher without preparation, why bother? The security on NAEP tests is extremely tight. There are no consequences for individual schools. There is little motivation or opportunity to prepare for the tests. We can reasonably assume that NAEP gives a more accurate and unbiased picture.

It is a simple matter to calculate a linear function that gives NAEP NCE scores as functions of TerraNova NCE scores, as shown by the solid line in Figure 1. The linear function can be used to interpolate between individual points of Figure 1, and with perhaps unwarranted boldness, to extrapolate beyond the values in Figure 1. With even greater boldness, we will assume that the linear function that applies to states also applies to individual schools within New Mexico.

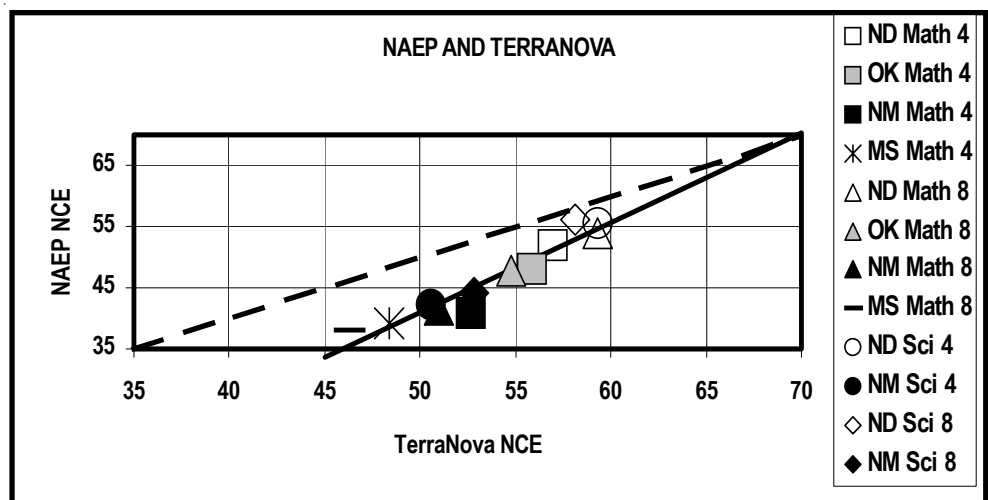


Figure 1.

Continued on page 8

Continued from page 7

We can now get a smooth curve showing the expected NAEP percentile as a function of the reported TerraNova percentiles, as shown in Figure 2. Of course, there will be some devia-

tions from the curve, but the error is not large. The dashed lines show the 95% confidence bounds.

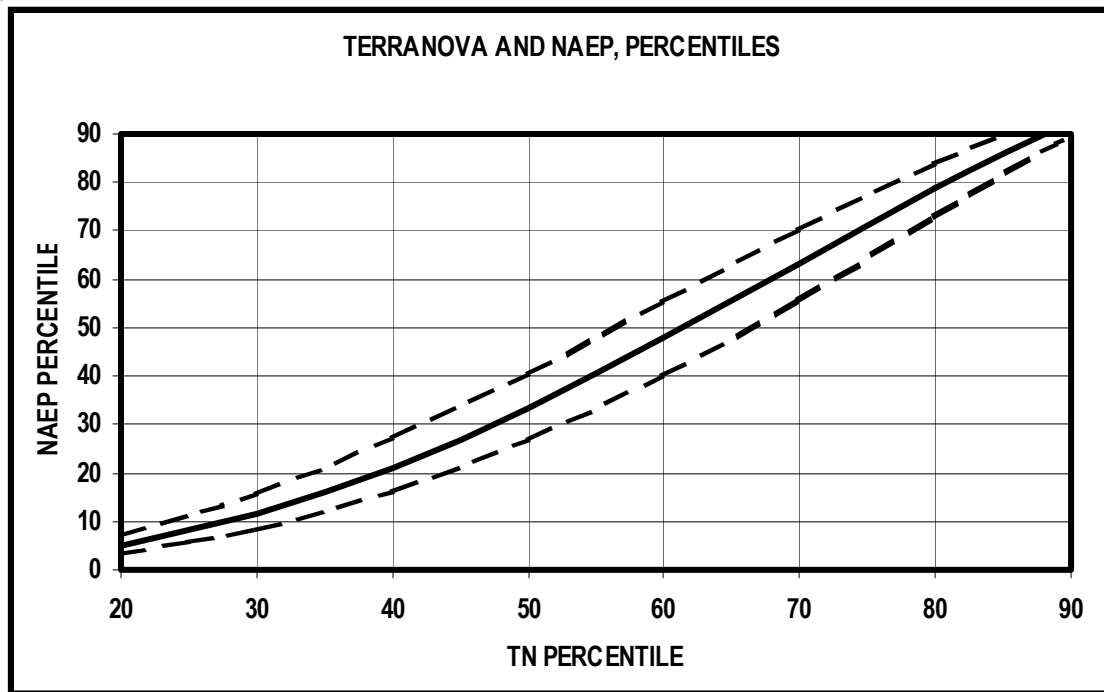


Figure 2.

If a school is reported to be at the 40th percentile, the “real” percentile is probably about the 21st, perhaps as low as the 16th or as high as the 28th. If a school is reported at the 55th percentile, it is probably actually about the 40th, perhaps as low as 33 or as high as 47. On the other hand, if a school is reported at the 75th percentile, that could be quite close. We can use TerraNova scores to compare districts and schools within New Mexico, to compare the achievement of ethnic groups within the state, or to set goals for achievement. TerraNova scores should never have been used to compare New Mexico with the nation as a whole.

Principals and district superintendents who have been congratulating themselves for meeting or exceeding the “national average” will never be convinced that they are nowhere near that point unless they are above the 60th TerraNova percentile. Anyway, New Mexico will be using a criterion-referenced test in the future. It will be interesting to see the results. At least, “focused instruction” will no longer be cheating. The test is supposed to conform to the standards, so diligent test preparation will mean teaching exactly what is supposed to be taught.

Walt Murfin
CESE Statistician

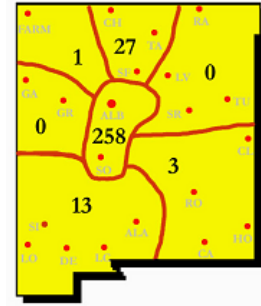
CESE NEEDS YOUR HELP

For many, the public image of the *Coalition For Science and Math Education* (CESE) is as foe of creationism – particularly as creationism negatively impacts the objective presentation of science in New Mexico’s science classrooms. To date, CESE’s membership numbers and expertise have been adequate to meet these challenges and in the process, CESE has become respected nationally as an organization dedicated to quality primary and secondary education. There is, however, more to CESE than its activities opposing creationism. The coalition is more broadly committed to:

- promote science and math literacy and
- work for excellence in all educational fields

Over the last few years readers of the *Beacon* have seen careful analyses of state standardized tests and a recognition from these that while some of New Mexico’s students do well, others do much less well. CESE is dedicated to raising boats for all of New Mexico’s students. While CESE’s membership numbers are healthy, the distribution of our membership is not appropriate for realization of these other challenges. CESE membership is large in the state’s larger metropolitan areas (Figure, but other areas of the state are less well represented – or not represented at all.

CESE needs your help. If you have friends or colleagues, particularly in areas where CESE membership is low, send them an email or give them a call. Inform them of all that CESE has to offer educators, parents and others interested in quality education for New Mexico’s students. Provide them with the CESE web address for information about CESE and applications (<http://www.cesame-nm.org/about.html>) or make a copy of the membership application in this newsletter and send it to them along with a recommendation that they join CESE. If you are a person interested in quality science and math education for New Mexico’s students, consider helping to organize a local group of CESE members. Your local group will certainly contribute to statewide initiatives, but for the majority of us, education (like politics) is local.



Figure–Number of CESE members by geographic region.

Although overall numbers are healthy, CESE’s membership is not evenly distributed in New Mexico

David Johnson
CESE Board Member at Large

2004 Membership Form
Coalition for Excellence in Science and Math Education (CESE)
non-profit, tax deductible

Member \$25

Family \$35 (Expiration date is shown on address label)

Student \$10

New Membership []

Renewal []

Donation []

Name _____ **Date** _____

Profession and/or affiliation(s)
 e.g. “Science teacher, member of ASCD” _____

Mailing Address _____

Phone _____ **Fax** _____

E-mail _____

Most of our communication is by e-mail

<http://www.cesame-nm.org>

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

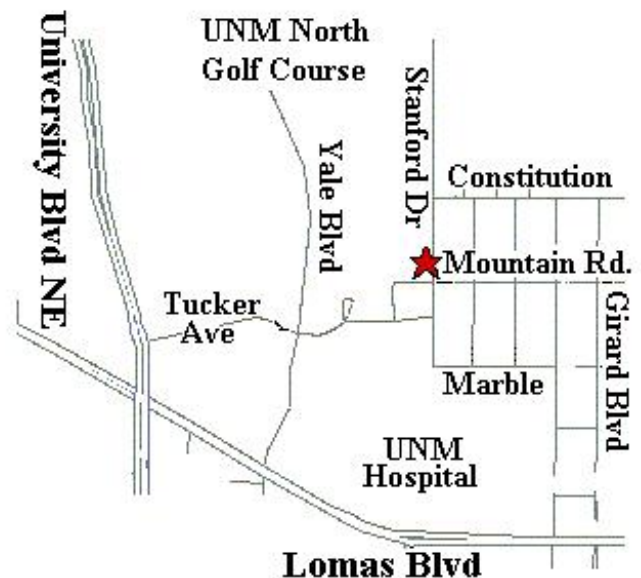


Return Service Requested

ANNUAL MEETING

Sunday
June 13, 2004 1:00 PM

**Keynote speaker —
NM Secretary of Educa-
tion, Veronica Garcia;
her topic is
New Mexico's Public Education
Department: Challenges and
Opportunities."**



**RSVP to Marilyn Savitt-Kring
mmkring@juno.com or 505-856-6654.**



**UNM Law Library Bldg
1117 Stanford Dr NE, Room 2402**