



The **BEACON**

News from The Coalition for Excellence in Science and Math Education

Volume XVI, No. 2

Queries? email M. Kim Johnson (next page)

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SPECIAL ISSUE: Some Commonly Held Beliefs about Education in New Mexico that are False and Misleading—Walt Murfin and Kim Johnson, President's Message —Terry Dunbar, Announcement of the 2012 Annual Meeting

PRESIDENT'S MESSAGE

A Teacher's Perspective on Research

Teaching is an isolating profession. A teacher spends the majority of his day with students. While there is more collaboration than there used to be, more team meetings of various sorts, a teacher's day is still mostly spent in the classroom with young people. We don't interact with other adults on a daily basis.

While we work in our classrooms dispelling ignorance, researchers from universities are busy examining the work that we do. Some look at individual classrooms to find what practices successfully raise achievement. Others look at whole schools, districts, and states. A rich body of research has been developed. Unfortunately all too many teachers do not have access to it.

Teachers do discuss best practices. Lesson plans are exchanged. In team meetings teaching philosophy is discussed, and often school-wide strategies to achieve success are devised. Interdisciplinary teams in secondary schools strive to improve students' educational experience. In recent years Robert Marzano's excellent research has found its way into schools and even some teacher evaluation checklists. Yet by and large teachers do not examine educational research and investigate why certain practices are more effective than others. What they know about education is largely anecdotal. You can hear similar conversations in faculty lunch rooms across the country. "When I was at school X, we employed strategy Y to keep kids studying".

"I read that in Japan every student is required to perform Z". While some of the anecdotal information we exchange is useful, much of what we "know" to be true turns out to be apocryphal. Other "truisms" are not supported by research.

This issue of the Beacon examines some of the myths that have arisen regarding education. Research data can sometimes fly in the face of what we teachers regularly accept as truth.

Terry Dunbar, Ph.D.

IMPORTANT ANNOUNCEMENT

THE CESE ANNUAL MEETING WILL BE HELD ON SATURDAY, JUNE 23, 2012, from 1:00 to 4:00 PM. It will be held at the Maxwell Museum Lecture Hall at UNM (Map on the page 7)

Please join us and our guest speaker, former State Representative AND State Senator, Pauline Eisenstadt. Pauline had a some significant impact at the beginning of CESE. You may see your name! Please join us and listen to fascinating stories deriving from her recent book: **"A Woman in Two Houses."**

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CESE annual dues are \$25 for individual, \$35 for family, and \$10 for students. Please see last page for membership form. Email Beacon submissions to Editor, M. Kim Johnson, kimber@comcast.net.

Introduction

During the course of almost 15 years of researching educational data for the purpose of both understanding and trying to derive a method to improve, we have come across a number of things that are simply “accepted” by most of the population, including educators, as being factual. Some of these beliefs may be true dependent on where people live. Some may not be true. Sometimes, what may be true in one part of the country is not at all true in another part. Some of these “truisms” are universally false. Any may lead to either stagnation or a waste of money that does not improve education, and may even cause harm. So Walt Murfin and I (M. Kim Johnson) have decided to select a few of the more egregious examples of things that are, simply put, not true, yet are commonly held beliefs. We must emphasize that although what we discuss here is generally believed across the nation, there are many things unique to New Mexico. And, I am going to say this at least once: Lew Wallace, a former Territorial Governor of New Mexico and author of the book, “Ben Hur,” once said (circa 1880): “All calculations based on experience elsewhere, fail in New Mexico.” He was very perceptive, so when speaking about education trends you believe true, please always consider that New Mexico may be very, very different, and that is what we try to concentrate on.

And finally, please remember that we are not presenting these items just for fun. In fact, most people who hear us say these things initially object strenuously that we cannot be telling the truth, or that there is a study somewhere that proves us wrong. Well, we have studied these things, because they are often integral to a large part of our work – to improve education in New Mexico. We cannot use truisms to do this when those truisms are, simply put, either false or much more complex than believed by the general public or general educator. If we are to advance education in our state, we must forgo old beliefs that have no basis here and those silver bullets for improvement that keep getting shot, most often missing the target, and provide real ways to determine how to improve. It has been over 30 years since the cry for improvement went up. And there has been little in the way of advancement in New Mexico since then as well as for most other states. To really improve, we must do something differently, as discussed in the last two issues of the Beacon, and above all, we must discard those beliefs that are wrong and that can lead to inappropriate actions that can stop us from considering new ways of advancing.

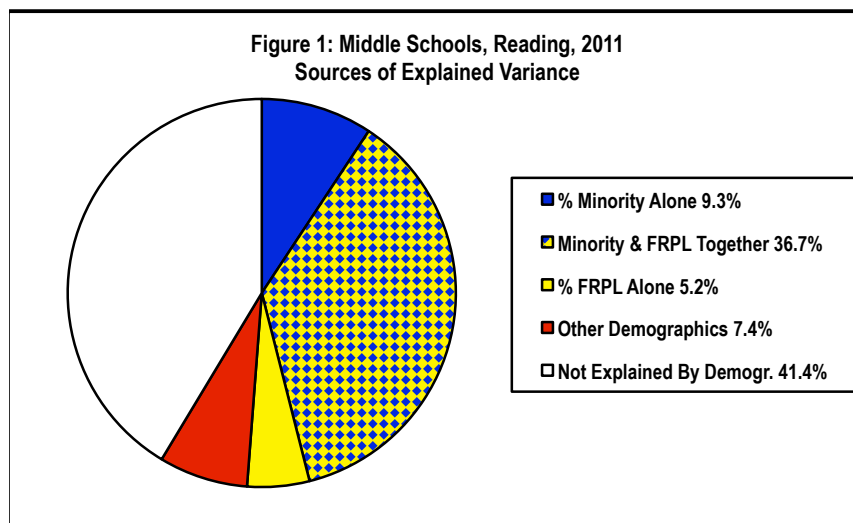
So here are a few of the most misleading beliefs that may not only lead to inappropriate practices, but that will, and do lead to the wasting of money for projects that, simply put, go nowhere as far as improving education in New Mexico is concerned.

COMMON BELIEF: Poverty is the Demographic Factor Most Strongly Associated with School Performance

(By: Walt Murfin)

This belief has been frequently repeated, based on studies nationally and in other states. It is often true for jurisdictions having lower levels of minority fraction, or where there are not wide differences in minority fractions between schools. It is definitely not true for New Mexico.

Although details differ by grade level, subject, and year of testing, school poverty fraction by itself plays a relatively minor role, independent of the association between economic status and ethnicity. The combination of ethnicity and economic status overwhelms all other school demographic effects. A high fraction of minority (Hispanic, American Indian, African-American) students combined with a high fraction of students eligible for free or reduced price lunch (FRPL) tends to be associated with much lower test scores. Figure 1 shows a typical case.



The FRPL fraction by itself is not highly explanatory. Additionally, from speaking with a group of New Mexico's Legislative Education Study Committee data analysts, they believe there is almost certainly more noise associated with these data when used as a proxy for poverty than the more straight forward percentage of minorities. However, the real indisputable fact according to the data is that it is the combination of minority and poverty and the interaction between them that is far more powerful in predicting

school performance trends. The combination of all school demographic factors typically explains more than 50% of score variance.

Summary

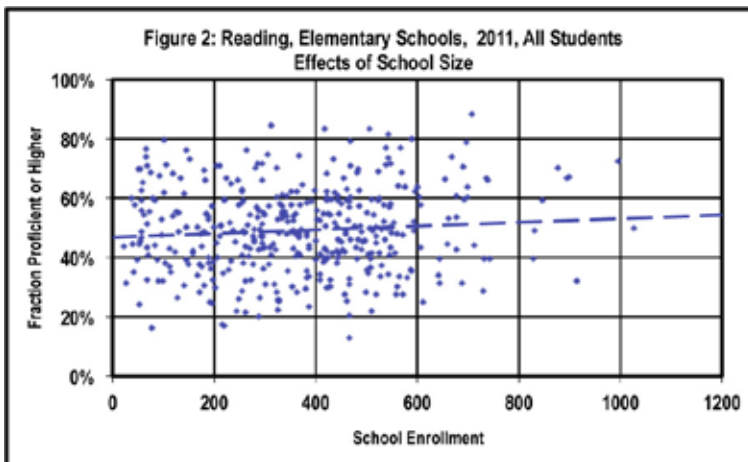
- The part of the poverty fraction not correlated with the minority fraction is not usually highly predictive for New Mexico schools, although it may be a powerful factor in other jurisdictions.
- The uncorrelated fraction of minority students in a school is often more important than the uncorrelated poverty fraction.
- The combination of minority and poverty is far more important than either of the uncorrelated parts alone.
- It is not possible to make a reasonable estimate of the effects of school demographics simply by inspection and intuition. The effects are complex, and can only be determined by careful analysis.
- Conclusions based on analyses in other states are often invalid for New Mexico without major modifications.

COMMON BELIEF: Small Schools Tend to be Superior

(By: Walt Murfin)

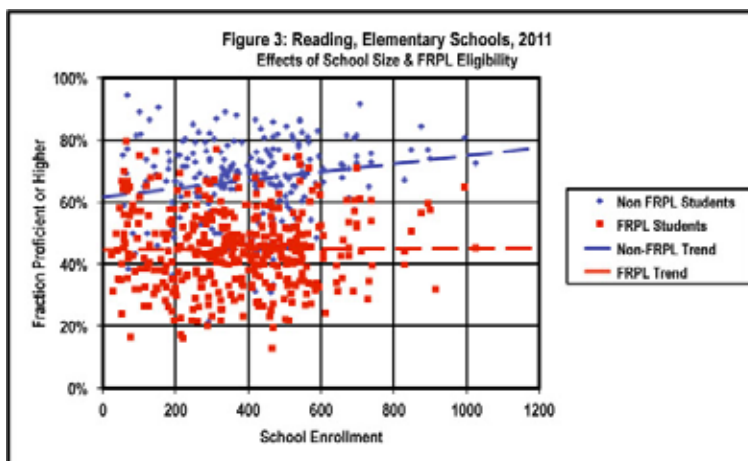
This widely held belief appears to be based on some poorly controlled studies in other states. Many analyses have shown that conclusions from other jurisdictions cannot be routinely applied to New Mexico schools. CESE has analyzed the relation between school size and performance in New Mexico for a variety of conditions: various years, school levels, subjects, and type of outcome measure. In almost every case, any relation between size and performance is small and is usually far from significant. In some cases, there is a positive (but usually weak) relation; that is, there is actually a small advantage for larger schools, which is seldom significant.

Any effect of size for all students in New Mexico elementary schools is almost invisible, as shown in Figure 2. In fact, there is actually a very small and far from significant advantage for larger schools.



Some studies purport to have shown a small school advantage for economically disadvantaged students.

Figure 3 shows no size effect for economically disadvantaged (FRPL) students in New Mexico. There is modest but significant advantage for affluent students in larger schools. Middle and high schools show a similar ambiguity of size effect.



Analysis of ethnic groups has not shown a significant size effect in elementary, middle, and high schools, except that there is a decided and significant advantage for Native American students in larger schools. High school graduation rates show no significant superiority of smaller schools. There are some small schools with high graduation rates, but a significant overall school size effect can only be shown by deliberate and potentially dishonest selection of data.

Summary

- Honest studies of New Mexico schools, without “cherry picking” the examples, do not show a significant preference for small schools. Contrary to some research conducted elsewhere, there is no significant advantage for economically disadvantaged students in smaller New Mexico schools. In many cases there is an advantage for larger schools for some groups.
- Any program leading to smaller schools will probably require new construction, at high cost. Any advantage from building smaller schools in New Mexico is far too small to outweigh the likely cost

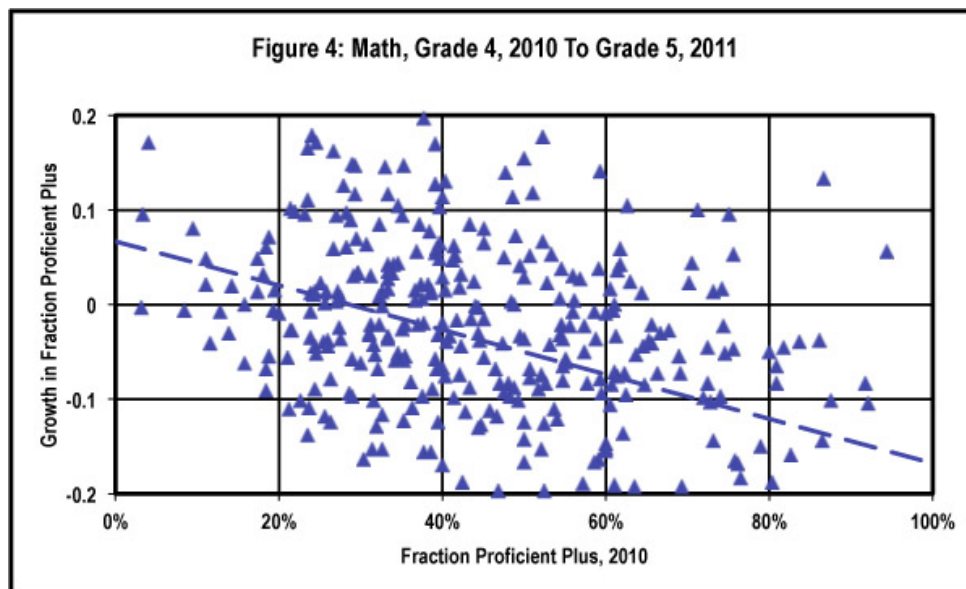
disadvantage.

- The relation between performance and school environmental factors, including size, is extremely complex. The effects cannot be estimated by simple inspection of the data. “Research” that has been relied on to bolster support for small schools has often been simplistic and poorly conducted in jurisdictions very different from New Mexico.

COMMON BELIEF: High Performing Schools Also Usually Have High Growth

(By: Walt Murfin)

Some reasonably high performing schools do also have high growth, at least for a year or two. Figure 4 shows the growth of students in elementary schools, from grade 4 in 2010 to grade 5 in 2011. There are at least three or four schools with above average performance in 2010 that display above average growth. However, for the overwhelming majority, low performance is usually coupled with high growth, and the majority of higher performing schools show low or only modest growth.



Summary

Although there are exceptions, high performance in one year is usually associated with low growth in the following year. A combination of high performance followed by high growth can only be shown by “cherry picking” a few unusual schools.

COMMON BELIEF: Pre-K and Kindergarten Helps Children to Perform Better in Later Grades

(M. Kim Johnson)

One of the most common beliefs that impacts significant educational costs is that Pre-K and Kindergarten programs provide significant help for students, particularly those with disadvantaged demographics, to perform significantly better throughout regular school. Generally speaking, this is simply not true, especially in New Mexico. Performance effects tend to be transitory and disappear by about the 3rd grade. However, to be fair, there are some early childhood programs that have actually been shown to be effective throughout a child’s education¹.

The problem is that the really effective programs are those that cost significant money per student, teach cooperating parents much of what they missed in school, intervene with parents’ or guardians’ maladaptive social problems, and last at least through and generally well past the third grade. The average public early childhood learning and kindergarten programs simply do not do this, and they do not cost nearly the money that these “super” early childhood programs cost. In fact, school systems generally cannot afford to take on these types of intervention programs. There is generally not enough money. They, instead, are constrained by state budgets that are already strained to provide education from grades 1 through 12.

It is worth backtracking a bit to follow how this research by CESE personnel proceeded, since it may be instruc-

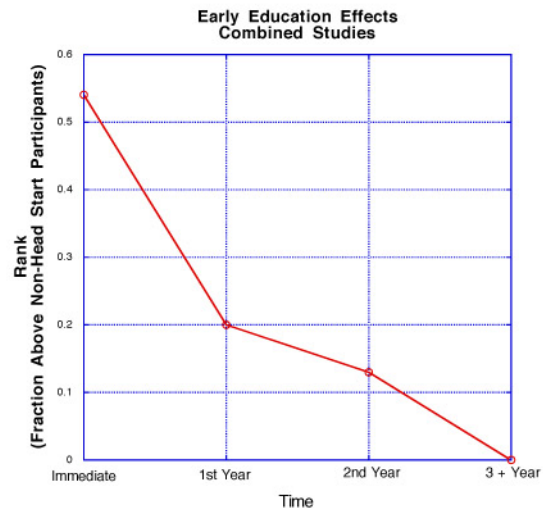
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tive. Figure 5 is from a study performed in 1985, as indicated in the reference in the figure. It shows the results of a meta-study (a compilation of many separate studies) of extended performances for those children primarily from the program as per 1985, encompassing approximately 20 years of data. Note that by the end of the 3rd year of school, there was essentially no advantage for students in early childhood programs program. But 1985 is not today, and these results are not exclusive to New Mexico. (Remember what we earlier said in the quotation from Lew Wallace about the uniqueness of New Mexico. We have found little to contradict that statement since then.)

Sometime after this discovery, New Mexico researchers, Dr. Richard Boyle and Dr. Aki Roberts, from the University of New Mexico Institute of Social Research, performed a two-phased study that addressed, among other things, the impact of Pre-K education in the out years of school. Part II of a two phase report² concluded that for one of the programs studied, pre-k students on the Free/Reduced Lunch Programs (FRLP – the same as FRPL – a proxy for poverty) were statistically less likely to be assigned to the special education program in the later years of school. The hypothesis is that students who might be headed for behaviors consistent with later problems attributed to lack of early discovery and intervention now have the chance to be diagnosed and receive preventative intervention much earlier than otherwise. (The study was for pre-K programs in Albuquerque.)

But what about the effects of full day kindergarten for all students in New Mexico? Probably the best data that provides an overall picture is from the National Assessment of Educational Progress (NAEP) results. This test is used throughout the US for comparison of how the country and individual states are performing over time. They are scaled tests (scores are adjusted such that changes in difficulty from test-to-test is accounted for), and they are given every two years. Figure 6 (next page) shows the NAEP results for New Mexico and the nation for multiple years ending in 2011. Both reading and math are included. These data are quite important regarding any potential net effect of scholastic performance of full day kindergarten (FDK). One would expect to see an identifiable increase in scores for those years corresponding to the first years that the FDK students began taking tests in both the 4th and 8th grades. Since FDK was phased in beginning in 2000 to 2004 with approximately 99% of all students now taking FDK. The first possible impact that FDK could have had on fourth grade scores was in the 2007 to 2009 ranges, and for 8th grade score the first possible influence was for 2011 - the latest year of testing. Note that for grade 4 math, an upward trend in New Mexico began in about 2004, well before the effects of performance would be expected to be seen. After 2004, the trend continues, with no noticeable change. For grade 4 math there is, in fact, a decrease in score beginning at the expected first impact of FDK and scores remain flat through the full impact period. For grade 8, the first potential impact is marked by the red square. Note that there was already a rising trend when the first effects might be expected to be seen. We see no indication from the NAEP scores that there is any significant impact on scholastic performance that is not buried by other possible factors. There may be other positive effects, as have been reported in numerous studies, but they seem not to impact New Mexico NAEP scoring output.

One consideration that is being studied more and more is that because of physiological brain developmental considerations, children do much better by waiting until approximately 7 years of age before starting the formal learning process. There have been several in-depth studies⁴ that conclude this, and at least one country, Norway, puts this into practice. Of course, we do not compare Norway directly with New Mexico. We are very different. But brain physiological development is not that different. However, this is a controversial topic. The research should still be considered to make a reasonable data-based decision on this issue of starting age.



Final Report, "The Impact of Head Start on Children, Communities and Families." U.S. Dept of Health and Human Services, DHHS Pub # (OHDS) 85-31193, 1985

Figure 5. Early, but excellent protocol summary data of Head Start results of student performance for students post program. Approximately 20 years of data summarized.

Were we to do away with FDK, we could apply the money spent (from about \$240.0 to 260.0 million, depending on whose estimate is used.) Even if just using the lower estimate, this money could be used to address those studied positive effects, such as studying the efficacy of earlier intensive diagnosis of potential special education related problems to at-risk students, or similar. Other money saved could be used in potentially more fruitful areas.

Summary

There appears to be no conclusive evidence that full day kindergarten, or many of the pre-K programs available to children, provide substantive improvement to public school long-term achievement in New Mexico, though some pre-k programs appear to be beneficial when studied on a case-by-case basis (see endnote 2). Additionally, there are potential programs for at-risk children that could be beneficial, but must be applied well past the 1st grade, and are almost certainly cost prohibitive. The money spent on FDK could almost certainly be put to better use in other ways to improve education in New Mexico, especially for at-risk students.

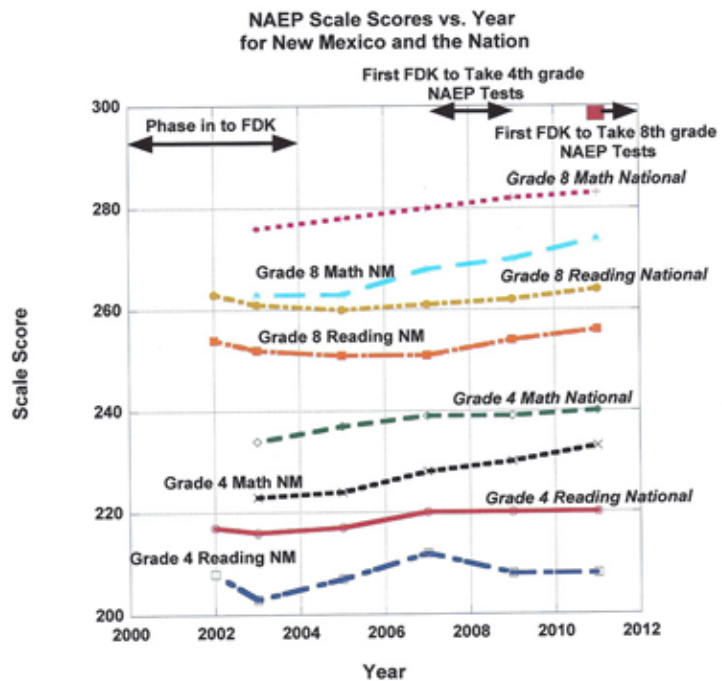


Figure 6. NAEP Score Trends for the Nation and New Mexico

¹ <http://www.icpsr.umich.edu/icpsrweb/PREK3RD/resources/447398.jsp>, among others, most of which can be found with a Google search

² LONG-TERM FOLLOWUP OF CHILD DEVELOPMENT PROGRAMS IN ALBUQUERQUE, PHASE II

³ http://nationsreportcard.gov/math_2011/gr8_state.asp, and similar for reading in 4th and 8th grades. Google NAEP the nation's report card for addition data.

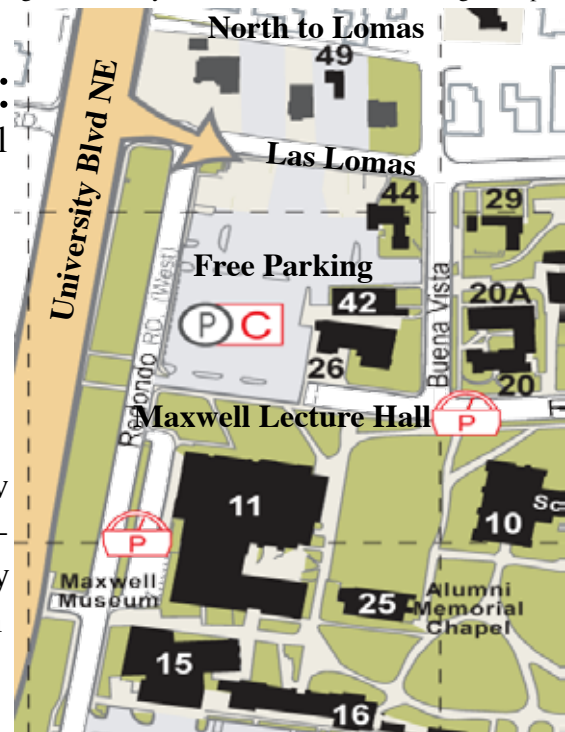
⁴ <http://www.frbsf.org/publications/economics/letter/2008/el2008-24.html>, this is a good summary from which to start researching the topic

CESE ANNUAL MEETING:

Saturday, 23 June, 2012 at the Maxwell Lecture Hall
(See #11 on map) at the University of New Mexico

PAULINE EISENSTADT,

former State Senator and State Representative, the first woman to be both, will speak about her new book: "**A Woman in Both Houses.**" This will be a good one that you won't want to miss! Remember the beginnings of CESE? Pauline was there and saw this from a very different point of view. In her chapter on "evolution," keep your eyes opened. You may recognize your own name! Please RSVP to Marilyn Savitt-Kring at marilysavitt-kring@comcast.net.



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