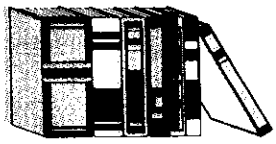
The Blumenfeld Education Letter



"My people are destroyed for lack of knowledge." HOSEA 4:6

Vol. 6, No. 8 (Letter # 60) EDITOR: Samuel L. Blumenfeld August 1991

The purpose of this newsletter is to provide knowledge for parents and educators who want to save the children of America from the destructive forces that endanger them. Our children in the public schools are at grave risk in 4 ways: academically, spiritually, morally, and physically — and only a well-informed public will be able to reduce these risks. "Without vision, the people perish."

The Great American Math Disaster

When *Newsweek* begins to sound like the *Blumenfeld Education Letter* when describing the failures of public education, then we can assume that the most ardent defenders of the public schools among our businessmen and politicians and journalists are well aware of the seemingly insoluble problems the system faces. However, when it comes to solutions, that's where we differ quite radically. We are always amazed at how readily and uncritically the powers that be accept the solutions offered by the educators. Considering how much emphasis the educators are placing on critical thinking these days, it's amazing how little of it is being exercised by the many intelligent people who are in a position to judge what the educators are doing. And so, it is left to us to do the critical thinking. What follows, then, is the *Newsweek* report of June 17, 1991, interspersed with our critical comments:

How bad are eighth graders' math skills? So bad that half are scoring just above the proficiency level expected of fifth-grade students. Even the best students did miserably; at the top-scoring schools, the average was well below grade level. Hardly any students have the background to go beyond simple computation; most of these kids can add but they have serious trouble thinking through simple problems. These grim statistics, released in June in the first large-scale state-by-state study of math achievement, prompted Education Secretary Lamar Alexander to declare a math emergency in the nation's schools. "None of the states are cutting it," he said. "This is an alarm bell that should ring all night throughout this country."

What's really frightening about these results is that the alarm has been ringing since the 1983 publication of "A Nation at Risk," the federally sponsored study that highlighted vast problems in the public schools. Yet despite years of talk about reform — and genuine efforts at change in a few places — American students are still not making the grade and remain behind their counterparts in other industrialized nations.

It's refreshing to hear our new Secretary of Education declare a "math emergency." And what's the cause of this dismal failure on the part of our students? Read on.

Most mainstream educators already agree that American math instruction needs a drastic overhaul, with more emphasis on group problem-solving and creative thinking rather than repetitive drills. But local schools continue to resist these prescriptions. "It's like we have a cure for polio, but we're not giving the inoculation," said Bill Honig, California's super-

The Blumenfeld Education Letter is published monthly. Sources of products and services described are not necessarily endorsed by this publication. They are intended to provide our readers with information on a rapidly expanding field of educational activity. Subscription Rate: 1 year $36.00. Address: Post Office Box 45161, Boise, Idaho 83711. Phone (208) 322-4440.

intendent of schools. Fewer than a third of the students surveyed regularly spent time in small-group work and the vast majority had never done mathematics projects or written reports on math. And most math classes are still mired in the Victorian age, eschewing the use of calculators and computers. About a third of the students had never used a calculator in math class and two thirds had never used a computer. Educators say too many children are wasting time practicing adding, subtracting, multiplying and dividing when they could be moving on to more interesting and challenging math.

It's amazing what a short memory *Newsweek* has of math instruction in American schools. Forgotten is the disaster called the "New Math" which swept through America's elementary schools like a hurricane during the Sixties and Seventies, uprooting the last vestiges of traditional arithmetic. If the educators were wrong then, what makes anyone think they are right now?

When educators complain that children are "wasting time practicing adding, subtracting, multiplying and dividing," it's obvious that these educators do not understand what arithmetic is all about. In the first place the word "arithmetic" is no longer used by our educators, and I doubt that few if any of them would even be able to define it. But there is a very important difference between arithmetic and mathematics, and if you don't know the difference you will not be successful in teaching either.

Our arithmetic is an ingenious counting system which uses 10 symbols and place value for all of its notations and operations. As such it is probably the diamond of human intellect, an invention which permits human beings to perform any counting feat with mere pencil and paper. But the key to its proficient use in calculation is memorization of the basic arithmetic facts. If you don't memorize the facts, then you are stuck in unit counting and you might as well use an abacus. Memorization requires rote drill, which is the easiest way to learn anything, provided it is taught correctly.

The problem with American educators is that most of them not only don't know what arithmetic is, but they don't even know how to teach it. When educators think that children can learn to compute without memorizing the arithmetic facts, they are deluding themselves and cheating the children.

Why is it important for children to memorize the arithmetic facts? Because memorization will give them mastery of the system. They will become aware of the number patterns throughout the system, be able to discover short cuts, and develop a system of cross checks should their memories fail them at any point. Also, once the arithmetic facts are memorized through drill and practice with pencil and paper, they will later be able to use calculators and computers with accuracy, spotting their errors when they make them, always able to do the calculations on paper if necessary.

What is the difference between arithmetic and mathematics? Arithmetic is a counting system. In addition we count forward, in subtraction we count backwards, in multiplication we count forward in multiples, in division we count backwards in multiples. Few of us use algebra, geometry, trigonometry or calculus. But all of us must use arithmetic — to do our tax returns, figure out mortgages, balance our checking accounts, use credit cards, make change, etc. So if everyone must use arithmetic, why don't the educators stress the need to develop good arithmetic skills?

Mathematics, on the other hand, deals with relationships. It may use arithmetic in solving problems, but it is quite distinct from arithmetic. Our educators have destroyed the distinction by mixing arithmetic and math together so that students don't know where one ends and the other begins. The result is mass confusion, not only for the children but the public at large. Read on.

The math study, part of the National Assessment of Educational Progress (commonly called the Nation's Report Card), was administered last year to a representative sampling of 126,000 students in public and private schools. Students in three grades — 4, 8 and 12 — were tested. The eighth-grade results have attracted the most attention because the scores were broken down by state for the first time since the inception of the test in 1973. State politicians originally lobbied Congress to forbid the release of this kind of detail, because they feared a backlash from outraged voters. Thirty-seven states, along with the Virgin Islands, Guam and the District of Columbia, finally agreed to participate. The 13 states that refused cited various reasons, most often a lack of funds. Participation cost each state $100,000.

Most educators predicted a poor showing on the math test, but the final tally was worse than expected. "Don't let the fascination with 'which state did better than which state' blind you to the state of the forest," says Chester E. Finn Jr., author of "We Must Take Charge: Our Schools and Our Future" and a leading advocate of national testing. "The forest did dismally." Even in the top states — North Dakota, Montana and Iowa — only a tiny minority of eighth graders scored above their grade level. The lowest scoring eighth graders could only do second-grade work. Says Finn: "We are on various positions on the cellar stairs."

Analysts emphasized that the math problem is nationwide. Only 14 percent of eighth graders scored at the seventh-grade level or above — and that includes students in well-regarded, wealthy suburban systems. The study showed that only 1 percent of eighth-grade students in one state, Virginia, were ready for calculus.

Why did eighth graders do so poorly, even in wealthy suburban schools? Because of bad teaching. Even in the top states, only a small minority of eighth graders scored above their grade level. Obviously, when even the richest and brightest fail, one cannot blame it on rote memorization when we are told that rote memorization is what makes the Japanese student so much better than the American. Our prognosis is that America's confused pedagogy produces confused teachers who in turn produce confused students.

Money alone doesn't seem to be the answer. Finn notes that the highest-ranking state, North Dakota, is 32nd in terms of per-pupil spending, while the District of Columbia, which spends the most per student, is second to last. There is even compelling evidence that the longer kids stay in school, the farther they fall behind expected achievement. For example, the majority of fourth graders (72 percent) tested at or above the third-grade level, and 11 percent scored at or above the fifth grade level. But by the time students reach the end of high school, many have fallen far, far behind. Only 46 percent of 12th graders can do seventh-grade work and only 5 percent can do precalculus work.

Why is it that the longer the kids stay in school, the worse they do in math? Because if there is little or no foundation, they cannot build on anything solid. If teachers do not even know how to teach simple arithmetic effectively, how can we assume that they know how to teach algebra, or geometry, or trigonometry effectively?

Instead of responding with defensive criticism, most educators seemed to welcome the test as a cleareyed look at the status quo — and an opportunity to start over. "We've all been led to believe that we were above average," said Francie Alexander, California's associate superintendent of schools. "These results should take care of that myth." Some potential criticism may have been defused by the structure of the test, which reflects the most current thinking on what an exam should contain. The questions were designed to evaluate problem-solving ability, not just mere computational skills; in fact, every student had a calculator at his side. The only other available state-by-state comparisons are college boards like the SAT and the ACT, but those are only for students going on to college — a self-selected-group. The national math test is a random sampling of all kinds of students taking the same test at the same time.

Now we're told that the students who took the test had calculators at their sides. In other words, they needn't have memorized the arithmetic facts! And they still did poorly. And since students did poorly everywhere,

the blame cannot be attributed to socio-economic disparities. Apparently, in their quest for equity, the educators are making sure that no child is deprived of his dose of educational malpractice.

Almost immediately after the results were announced, schools began announcing blueprints for change. In California (ranked in the bottom third), officials said they would revamp their junior high-school curriculum by stressing real-life problem solving, use of calculators and computers, and writing about mathematics. Honig said the program will begin in 100 schools in the fall, and branch out from there as textbooks are ordered and teachers are retrained to use new techniques and curriculum.

Bill Honig, of course, is the California superintendent who tried to close down the Institute for Creation Research, believes in whole language, opposes Chris Whittle's plan for private schools, and is now going to revamp the math curriculum in his junior high schools. This quintessential bureaucrat, who has been superintendent of California's schools for a good many years, has just discovered that the students are failing in math. Why did he need a national test to inform him? How come he didn't know how math was being taught all these years in his schools? Aren't superintendents supposed to know this? And, now, why the mad rush for new textbooks (which usually take years to develop) and new teaching techniques before they've been sufficiently tested to see if they work? The answer must be that Mr. Honig is a phony who pretends to know what he's doing.

While these changes may help, other data gleaned from the study indicates that curriculum reform by itself won't cure everything. A range of factors, from income level to television habits to parents' marital status, were linked with performance. Alexander called this the "91 percent factor," referring to the 91 percent of students' time that is spent outside school. "The only ones who can do something about these results are first, the students, then, their parents, the schools and the communities," he said.

Students with higher scores tended to have parents with some education beyond high school and were more likely to live with both their parents. These students also reported doing more homework, missing less school and watching fewer hours of television than students who had lower scores. Across the country, eighth graders watched at least three hours of television a day, but in the lowest-scoring schools, such as the District of Columbia, students said they watched six or more hours per day. Eighth graders in private and parochial schools had slightly higher scores than public-school students although the difference was reduced by grade 12.

After telling us that failure in math was a national phenomenon affecting rich kids and poor kids alike, we are now led to believe that socio-economic conditions may significantly influence a student's performance. If low-scoring students in the District of Columbia watch more television than high-scoring students in suburbia, it may be that the poor kids have fewer opportunities for safe recreation than the students in suburbia. The latter may watch less television because they are spending more time playing tennis, softball, soccer, ice hockey, attending dance classes, practicing a musical instrument, taking riding lessons, or bagging at the local supermarket.

Not surprisingly, Asian-Americans did best overall, with scores in all age groups significantly higher than any other racial or ethnic group. However, Hawaii, the state with the highest proportion of Asian-Americans (67 percent), was one of the poorest scoring states. One possible explanation: Hawaii's Asian-Americans include many who have been in this country for several generations. This may indicate that assimilated Asian-Americans perform just like other Americans. The results showed no difference between the performance levels of girls and boys in grades four and eight; however, in the 12th grade, boys did better than girls — suggesting that cultural pressures don't kick in until high school.

While the task of overhauling math instruction may seem monumental, educators say it is urgent — and essential — if the nation is to compete in a global economy. "Until recently, the public was perfectly happy with students who could do the basics of adding and subtracting," says Shirley Hill, chairman

of the National Research Council's Mathematical Sciences Education Board. "Now we realize how much more students need to know, and people are going to be upset that they don't know it." In most of the rest of the world, adding and subtracting are considered merely steps in mathematical mastery, just as spelling and grammar are the building blocks of literacy. Many so-called reforms are standard procedure in other countries. Honig says that in Japan, students routinely talk and write about math, and work with real-life examples.

I wonder where Shirley Hill got the idea that "until recently the public was perfectly happy" with students who could add and subtract. Complaints about the decline in math ability have been heard since the New Math came and went. In 1983, John Saxon wrote:

"For the last twenty years, these (mathematics) experts have worked unwittingly to bring matters to a point where only the brilliant can learn mathematics. They have tried to teach advanced concepts and a general overview before the student has learned the basics. . . . In an important sense, these authors are experts neither in mathematics nor in education. They do not know which mathematics topics must be mastered at which level and have no understanding of the capabilities of the average student. Their books are visible proof that they do not know how children learn and assimilate abstractions." (*National Review*, 8/19/83)

In 1986, Saxon wrote in the *Wall Street Journal*:

"I have just reread the California Department of Education's new regulation for mathematics. It requires that calculator instruction be included in every elementary-school textbook approved in the state. . . . Common sense tells us that if calculators are approved and made available too early, many capable students will resist doing the arduous paper-and-pencil practice that is necessary to develop the mental skills of arithmetic. Then these students will be unable to do simple computations in their heads, and, worst of all, they will not be able to estimate. . . . I believe that this California regulation will do great damage in all 50 states. . . .

"Something is dreadfully awry in mathematics education in America. A December 1981 issue of The Mathematics Teacher reported the results of a national test in which 82% of the American 17-year-olds tested did not know what the word "area" means. Last year the results of a test of mathematical ability of students in 24 nations were released. The 500 classes of American students that participated scored near the bottom of the Western nations and just above Swaziland —75% of the Japanese students scored higher than the top 5% of the American students. How much lower will they score after the California calculator plan is implemented nationwide?" (*WSJ*, 5/16/86)

Well, now we know the answer. Are you listening, Mr. Honig? Are you listening Ms. Hill?

In this country, teachers say they're most optimistic about the performance of children in the early grades, where reforms are more widespread. Young kids are used to hands-on mathematical-learning tools, such as blocks, puzzles and games, that make numbers relevant and fun. Today's first and second graders are on the cutting edge, says Iris Carle, president of the National Council of Teachers of Mathematics. Soon these young children will be coming into the middle schools," she says, "and they will force change because of their personal experience with critical thinking and application of real-life math skills."

When the president of the National Council of Teachers of Mathematics tells you that today's first and second graders are "on the cutting edge," you know she's full of baloney. First and second graders are hardly in a position to be inventive pioneers, creating the new and untried. Nor can they be critical thinkers for the simple reason that they lack the experience and maturity necessary for an adult thinking process. First and second graders learn by imitation, and that is

why rote learning enables them to master the basics when taught properly. Drill establishes correct habits and correct symbolic associations. Our marvelous arithmetic system can be mastered by first and second graders, provided they are permitted to do so by their teachers.

Is that just wishful thinking? Since 1973, the results on the national math tests have shown a steady record of disgraceful performance. This time we know which states are the worst; before this we knew only that something was terribly wrong. The nation is still at risk and time is running out.

Obviously, the proposed "reforms" are only going to make matters worse. Group problem solving, critical thinking, calculators and computers are not going to improve anything if the children are not permitted to master their basic arithmetic system. As for the need for students to work on real-life math problems, what kind of problems do the educators have in mind? The answer to that question may be found in the article that follows.

Framingham Has High Hopes For New Math Program

In September, Framingham (Mass.) High School will offer its 763 algebra students a state-of-the-art program that school officials say will "dramatically" improve national and state rankings, and eventually raise college board scores.

The new math classes will be taught with lots of graphics, will emphasize practical problem solving and will have students teaching each other. "We are training people to be good thinkers and to reach their potentials," said Joseph Hannigan, Framingham High's math department director.

The development of the high school program began in 1988, coinciding with a national call for better math students after the United States scored below average in international rankings. In 1989, the lower schools joined the program, and officials say that, ultimately, all Framingham students will be fully immersed in "new math."

"It's something that every school district in the country is trying to develop," said Cynthia Dunham, Framingham's elementary math and computer coordinator. The textbooks the students will receive in September are part of the program. In addition to colorful pages stressing graphs and charts, their emphasis is on practical problem solving.

For example, old geometry texts dealt with angles and vectors using long word problems and simple diagrams. In the new books, students plot the optimum course a billiards ball must have to land in a side pocket. Methods for teaching "new math" are also different from traditional lecturing techniques, teachers said. Students are divided into groups of three in what Hannigan called "a cooperative learning process."

"Academically, ethnically and genderwise, they have to be as unlike one another as possible," he said. And then the students teach each other. "They, in turn, learn better themselves. There used to be passive participation in the classroom, but now it's active," he said.

Students in all grades also are being introduced to more modern mathematic dilemmas, from statistics to error approximation, teachers said. The use of computers and calculators are an integral part of the program, with much of the homework for elementary school students and high schoolers alike focusing on writing computer programs.

"The use of the computer enables kids to ask 'what if?' and to get instantaneous feedback," Hannigan said. But budgetary restrictions stand in the high school's way of

acquiring enough computers, he said. The program depends now on outside grants and increased training for teachers in the lower schools. (*Middlesex News*, Framingham, Mass., 7/4/91)

Vital Reading

Mathematics: Is God Silent? by James Nickel, Ross House Books, P.O. Box 67, Vallecito, CA 95251, 126 pages.

When I was asked some years ago by Dr. R. J. Rushdoony to read this book in manuscript and evaluate it, I found it so very fascinating that I wholeheartedly recommended it for publication. And now that it has been published I recommend that it be read by anyone and everyone involved in teaching or learning mathematics, particularly Christian educators and home-schoolers.

The author asks: "How many Christian parents, students, and educators are there that can articulate a biblical approach to mathematics let alone affirm that there is such a view?" Obviously, not many. He writes: "A biblical Christian teacher will not be content to teach students *just* the mechanics of mathematics. A vast gold mine of history, philosophy, and breathtaking revelations of the manifold wonders of God's creation lie behind the mathematical formulas. In order for the student to see these rich nuggets, the teacher must be skilled in 'prospecting,' so to speak. For example, the surface beauty of a rainbow is appreciated by all. . . . But, buried in this beauty, and uncovered only by the industrious researches of the mathematician, lies a marvelous complexity and order. Before the eyes and mind of the student, the teacher must dig up these treasures and bring them to the surface."

The book is divided into two parts. Part One gives the reader an overview of mathematics history and philosophy, while Part Two deals with mathematics teaching. Concerning the latter, Nickel quotes Larry Zimmerman who wrote: "If mathematics is the basis of creation, its nature revelatory of God and its purpose is to glorify God; the Christian teacher must desecularize mathematics for his students. That is, he must polish away the patina of secularization with which mathematics has become encrusted so its true, God-reflecting nature shines through."

In reading this book, one is surprised to discover how deeply religious were some of the great scientists and mathematicians of the past. Indeed, they marveled at God's universe. Isaac Newton wrote in *Principia*:

"This most beautiful system of sun, planets, and comets could only proceed from the counsel and dominion of an intelligent and powerful Being. . . . This Being governs all things, not as the Soul of the world, but as Lord over all."

Johannes Kepler, who developed the famous laws of planetary motion, wrote: "I feel carried away and possessed of an unutterable rapture over the divine spectacle of the heavenly harmony."

Today's public schools tell the children nothing about the religious lives of these great men, and, in doing so, remove from these historical figures their spiritual dimension. There is nothing more damaging to children than deliberately depriving them of the spiritual content of whatever it is they are learning. But that's what secular education does. Hopefully, this book can repair some of the damage.

Finally, as Dr. Rushdoony has written in *The Philosophy of the Christian Curriculum:*

"For the Christian, mathematics is not the means of denying the idea of God's preestablished world in order to play god and create our own cosmos, but rather is a means whereby we can think God's thoughts after

Him. It is a means towards furthering our knowledge of God's creation and towards establishing our dominion over it under God.

"The issue in mathematics today is root and branch a religious one."

Correction

In our June issue, #58, we gave an incorrect address for Ross House Books. The correct address is P.O. Box 67, Vallecito, CA 95251.

LA Schools Adopt Bullet Drills

With the spread of gang violence in inner cities, some schools are adopting the "duck and cover" nuclear bomb drills of the 1950s to protect children from the more immediate threat of neighborhood shootings.

In what teachers call a "gang-drop drill" or a "bullet drill," children in some schools in high-crime areas are taught to drop flat onto the floor "so the bullet would fly right across you," as one fourth-grader put it.

Some teachers say they keep their students away from windows and teach them to "slither like a snake" if shots are fired when they are in the playground.

Teachers and administrators are reluctant to discuss such safety measures for fear of alarming the public, and the extent of the drills is impossible to quantify.

Donna Madath, a third-grade teacher at the Wadsworth Avenue Elementary School in a high-crime area of Los Angeles, called the procedures "the new generation of bomb-shelter drills."

Her colleague, Connie Covert, said the way the school bell rings tells students what to do. "The fire bell goes ring-ring-ring," she said, "but our gangster bell is riiiiiiing, and it doesn't stop, and what happens is that when you hear that bell you go flat on your face."

Twice last year, she said, she put the drill into practice when shots were fired as the class was playing kickball on the broad, exposed playground.

"You hear bang-bang — or pop-pop is more what it sounds like — and all the kids drop flat down and cover the backs of their heads," she said. "They are supposed to wait for my signal, but they know much more about this than I do, and usually I end up saying, 'Was that gunfire?' And they'll say, 'Yeah, that was gunfire.'"

In this atmosphere nationwide, more and more schools are closing their campuses to outsiders, hiring armed security guards, banning gang-style clothing and, in at least 23 districts around the country, using metal detectors to scan for weapons.

At the Charles A. Lindbergh Middle School in Long Beach, Calif., officials spent $160,000 three years ago to build a 10-foot-high, 900-foot-long, 8-inch-thick concrete wall to protect children on the playground from gunfire at a nearby housing project.

In Sherman Oaks in the San Fernando Valley, a middle-class town that has remained relatively insulated from urban crime, parents at one junior high school mobilized themselves into a campus security patrol last month after the apparent gang shooting of a student in the school yard.

Bob Terte, a spokesman for the New York City school district, said that a variety of security measures are used, including metal detectors in 16 schools, but that there is no district wide policy of drills related to violence.

But he said that the drills could be in use in individual schools or classrooms and district officials might not know of them. (*Idaho Statesman*, 6/16/91)