Once while touring the back roads of Vermont, I saw a sign in front of dairy barn that said: "There are no minus cows on this farm." Well, okay, I made it up. But I have imagined such a sign, because that sign would explain one of the reasons some children lost interest in mathematics early in the game. Minus cows is one problem, and the other is two-thirds of a turtle, or half of a dog -- a real dog, not a hotdog. The children who stick with mathematics a little longer will become discouraged or disgusted later, when it turns out that some of the kids who are good at math are promoting atheism or have Asperger's Syndrome or cannot do team sports, or they are being told that they are geniuses even though they behave like they social development problems. The other thing that causes many children to become disgusted with mathematics as a life-time goal is the teachers and parents talk about mathematics like it is the best sign of intelligence, and some kids have it and most don't. In other words, if you are good at math you are a genius. If you are not good at math, or do not learn the math lessons quickly and perfectly, you are just "an ordinary person." Later still, the final blow to the status of mathematics as a lifetime goal is the unfortunate but real association of mathematics with the building of weapons. Math is good for making war, so if you like peace, and you become a mathematician, you will be hired and paid to make the advanced technological weapons of war. That takes care of math for many students, except those who want to go into medical and biological research.

So, what happens in our schools is that an interest in math gets discouraged regularly, in a seqence that steers students away from math at various stages of their lives as students. If you are good at math, your life can be all set for you. You will be known as a genius by your family and friends. You will be a ready-made rational atheist and you will not have to waste any time on stupid religion. You will be paid well to do the calculations that make your brain feel good. You will not have to feel responsible for anything, because all you do, according to the religion that I call "Mathematical Atheism," is show people how to do things. You do not accept responsibility for any political decisions to make

and use weapons. You do not like war or killing or destruction, just math. You are just a nice man, an innocent genius who does math. If you are female, you will be regarded as cold, asexual, "weird." You are not responsible for anything done by the weapons built with mathematics.   Except that the use of math to make war, and the practically mandatory mathematical atheism, are the two most effective forces that turn youth and young adults away from a lifetime commitment to mathematics. You are above it all, stupid irrational religion, and politics. You are just a scientist, but maybe also a fool. You join a committee of "concerned scientists." Not only is science being used to kill people, it is also being used to destroy life on Earth. You have the money, the mansion, the car, the status, so you can spend a few minutes a week to be concerned. Thanks for your concern. Two plus two is still four, Mr. Scientist, and you benefit from both types of destruction. You make your living doing both of these things, but you are protected from responsibility. You do your math in a protected environment, and the decisions to destroy life are made by administrators and politicians. Even though you are forty or fifty or sixty years old, you are still a child genius doing math for fun, and you are safely separated, thanks to "science," from stupid religion and politics. However, you are still living in that old world of infantile privilege. You ARE responsible for all that you claim is not you: the stupid religion, the wars, the environmental destruction. You are the most useful and the most destructive of all tools. You are used and you are valued for your usefulness. What's wrong with that? It is self-serving nonsense. And it all started with a minus cow.

Einstein and Scientists and the Politicians

There is a story, a true story from central Europe in the twentieth century. As the National Socialist Party was rising to power in Germany, the government asked scientists to sign a statement that they would support the rebuilding of the German military industries, including research into the design of advanced weapons. Many scientists, most of those in positions of academic authority, signed that statement. Albert Einstein and another scientist offered an opportunity for scientists to sign a statement that they did not want to work on the production of military weapons. That statement of scientists for peace was signed by only two German scientists. And therein you see the explanation of

why modern science has become so dangerous and destructive. Originally, in the time of Francis Bacon, usually identified by historians as the birth of modern science (around 1500 CE) the promise of the scientific method is that it would free humanity from the burden of harsh labor. We would learn how the universe works and use that knowledge to liberate humanity and make life easier and more secure for everyone. Science would not only bring us successful technology, it would help us to build a just and democratic society. That was the original promise of science. But what really developed over the first 500 years of modern science? Our natural environment is so damaged by the "unintended consequences" of scientific fools that we have changed the planetary climate, poisoned the air, water and soil, and we might actually cause mass extinctions, even our own extinction. While we have that cataclysm to worry about, it is also possible for an invisible and silent drone to fly over your head and blow up your house, or you, or your entire family. Where's the part about freedom and security? The problem is visible to most people. Those with lots of money buy scientists. We think of rich people being lucky because they can buy a big house and cars, and planes and vacations, and the best food and clothing. But really, before they buy all those luxurious things, they begin their careers as rich people by buying scientists. You buy scientists first, and then you can buy everything else. The poor scientists. The thought they were free, free of stupid religion and bad politics. But they were bought. Among all slaves, scientists are treated the best.

There Are No Minus Cows on This Farm

What is a minus cow? Well, it is a problem. It is supposed to be the opposite of a plus cow, and you hear about it early in life in your classroom from a math teacher. If a farmer sells cows, or some cows die, they can be designated as minus cows. So, one hundred cows are the plus cows, and three cows that die are the three minus cows. And so one hundred minus three equals ninety-seven cows. But where did the three minus cows go? Did they disappear? And can three minus cows exist as three minus cows? The correct answer is no, there are no minus cows and no plus cows, just plain cows with no "sign," no plus sign or minus sign in the real world. The solution to the strangeness of cows that carry a "sign" showing whether they are plus cows or minus cows was discovered by accountants in medieval Venice. At that time, Venice was a very busy and

very important center of trade between Europe and the Middle East. So, they had accounting problems. The people who kept the commercial records of sales and trading, income and expenses, had the best intentions, but they made mistakes and their accounting mistakes sometimes caused major problems. So, someone came up with an idea that changed the commercial world forever, including stores, banks, shipping companies, manufacturers, craftspeople, everyone in business. It is called the "double-entry" accounting system. What it means is that every type of business transaction, or economic transaction, is recorded in two accounts instead of just one. One of those accounts is a "credit" account where all of the values are credits to the account or "plus" values, and the other account, which actually is a second account keeping track of the same transactions, is a "debit" account or a record where the values are debits to the account or "minus" values. This double entry system significantly reduced the accounting errors simply because the record keepers had to enter the value of the transaction twice, and they had to match up. There could be more than one debit account that matches with the total of a credit account, and vice versa, but the point is that with each transactional value being entered twice, both as a credit and as a debit, ANY ERROR WOULD SHOW UP IMMEDIATELY IN THE MISMATCH OF THE DEBITS AND CREDITS. This new system worked so well it was adopted throughout the world and has been used ever since. AND, the thing that is interesting about the "double-entry" accounting system is that it reflects exactly how the real, physical universe works: there are no plus and minus cows. There are only cows and any cow that is moved in any way, such as from life to death, or from Farmer Bob to Farmer Sally, those cows do not change from "plus" cows to "minus" cows, they just move from one place to another. Or, from one group or set to another group or set. Just check on the meaning of "set" in mathematics and you will see how simple the problem of "minus" cows is. So, the solution to the problem of minus cows and minus people and minus cars and minus houses is amazingly simple, because these things are all just things. They cannot be, in the real universe plus or minus things, but just things. The solution is that your math teacher was so enthralled with the beauty and fun of NUMBERS they thought that since a number can be plus or minus that ANYTHING is either plus or minus. That is what happens when a person becomes a mathematician and becomes hypnotized by numbers.

Only number values can be either "plus" or "minus" in the internal mental world that we create and call "arithmetic" or "mathematics." Of course there are plus and minus numbers, because we make it so, in order to "subtract." But, it is true, unavoidably and absolutely true, that there are no minus cows on any farm, and there are no minus farms and no minus farmers. There are only minus numbers. If your math teacher could only have acknowledged that important truth, you might have stayed interested in mathematics a little longer. Even if you tolerated the craziness of minus cows, you probably really freaked out when you came into contact with the pet store owner who sold two-thirds of a turtle.

Two-thirds of a Turtle:

There once was a pet store owner, a nice lady. Her name was Sally. One of the pets that she took care of and sold to the general public was turtles. She kept good records and at the end of the year in 2014 she added up all the turtles that she had sold for that year and then divided by 12 to see how many turtles she sold per month. She sold 128 turtles in 2014, so that means she sold 10 and two-thirds turtles each month. When she told her young nephew Billy, who loved the pet store and wanted to be a pet store caretaker or a zoo keeper when he grew up, Billy crinkled his forehead and asked a question. He asked his Aunt Sally how she could sell two-thirds of a turtle. So, Sally explained to Billy that it was just a numerical record. It was only the number that was two-thirds. Neither she nor any pet store owner would cut a turtle into two pieces so that one piece was two-thirds of a turtle and the other piece was one-third of a turtle. It still seemed odd to Billy, but he did understand that it had something to do with math and he felt a little sick inside to think that in order to take care of animals he would have to learn more math from Mr. Sticklehead, his math teacher, who always got anxious and spoke with a threatening tone in his voice whenever the kids had a test or homework assignment and Mr. Sticklehead said: "SHOW YOUR WORK!" This mathematical law, enforced by math teachers everywhere, is one of the strongest discouragements to students to stay interested in math. This concept of "show your work" is really a deception. It does not mean I want to see how you did the computation. What it really means is in order to get a good grade you have to show me that you are doing all of your math computations MY WAY, AND

YOU WILL GET A BAD GRADE IF YOU TRY TO DO IT ANY OTHER WAY.

<u>Show Your Work</u>: (means show "my" way of working, my math, not yours)

This old command, which was popular before we had electronic calculators, is perhaps beginning to lose its meaning. Now that we have electronic calculators, we know that a computer, or "electronic brain" needs to have a math "co-processor" in order to process numbers and any computations or manipulations of number values. This reality is a scientific recognition that processing of numbers is a special mental or neurological or electronic procedure. So, people are just beginning to understand that each individual human being has a math "co-processor" in their brain, and math co-processors are not all the same. Just as some people have blue eyes, and some have brown eyes, or some people are good at basketball, and some are not so good, there are differences in the ways that people naturally process numbers, IF they are allowed to. But we are still not allowed to process numbers the natural way that our brains want to, or are inclined to. When we are in school or at home or anywhere and learning math, we are told that there is one way that is allowed. Even though the scientists and mathematicians say that mathematics is a language, they still talk and act as though it is the only language that should be permitted. They say that it is a "universal" language, which would mean it is a language spoken, written, and understood throughout the universe. But this is obviously wrong. It is an "international" language or "planetary" language, spoken, written and understood throughout most of human civilization on Earth, but that is not the entire universe. Humans are ethno-centric and racist and anthropomorphic, and narcissistic, so we talk and act as though the Earth is the whole universe. But it is not. Our mathematics is a cultural invention, a language that is no more a universal language than is English or Russian or Chinese. Being a language, it can be learned, and it can be translated. But the only language that is universal is the language of shapes, which we know as "geometry" and "trigonometry" or as "proportion." Our mathematical symbols are our mathematical language, and other civilizations will have other symbols, but a circle is a circle and a square is a square and a right triangle is a right triangle everywhere in the entire universe. That means geometry, not mathematics, is the universal language. And, as strange as it may sound, geometry is not a language. A language is a system of communication where

a symbol stands for a meaning other than itself. Circles, squares and triangles are not symbols that stand for something other than themselves. They are what they are. They could be used as symbols, but in the real, physical universe, they are real objects that have definitions and character that does not serve as a symbol for anything other than what they are. Think. A drawing of a little tree, such as the letter "t" could have symbolic meaning, such as for a tongue sound. But a real tree does not stand as a symbol for something else. Real circles, squares and triangles and other shapes that are made up of mixtures of shapes, are the only universal language. When one group of humanoid beings communicates with another group that they have an understanding of circles, squares and triangles, that is when communication between two civilizations begins. A civilization of humanoid beings reaches a threshold of understanding when it knows that the value of pi, the circumference of a circle, can be constructed as a straight line. It is at that time that the humanoid civilization comes to understand that their mathematical language is not universal, and that the universe is proportional and that our cultural mathematical language is our neurological perception of proportions.

So, what this means for all children learning math, is that many are discouraged from studying and practicing mathematics because they are taught that their way of processing numbers is wrong and ineffective. This becomes the common message that "you are not good at math." When, in fact, some of the greatest processors of numbers, boys and girls who could become the greatest mathematicians in the world, do not process numbers the same way that they are processed according to our *institutionalized international language of mathematics*. If instead of having an authoritarian institution of mathematics, our concept of **freedom of expression** applied to the processing of numbers, human civilization would progress faster. The fact that our mathematical language is not only our perception of proportion, but is also only one of many possible mathematical processing languages, is a scientific fact that distinguishes intelligent beings from technological animals. The door to becoming an intelligent species is open to us, but we still like where we are, fear change, and we hesitate to leave the room in which we are comfortable. We are afraid that if we leave our animal world and enter into the world of intelligence we will lose something that we cherish: our emotions. In order

for the human species to become free, we must fully understand the meaning of the fact that our mathematics is our perception of proportion in the universe, and in order to do that we have to explore the reality that our mathematics is a cultural artifact. We have to stop insisting that there is only one mathematical language.   There are many mathematical languages, and we have to allow children to speak in their own mathematical language in order for human civilization to move from the room of technological animal to the room of intelligent being.

Examples of other mathematical languages include the binary number system, casting out nines, and changing our list of mathematical meaning symbols.

Here are linguistic symbols used in our mathematical language:

From the Greek alphabet:

A	α	Alpha (al - fa)
B	β	Beta (bet - ah)
Γ	γ	Gamma (gam - ah)
Δ	δ	Delta (dell - tah)
E	ε	Epsilon (ep - salon)
Θ	θ	Theta (they - tah)
Λ	λ	Lambda (lamb - dah)
M	μ	Mu (moo)
Π	π	Pi (pie)
P	ρ	Rho (row)
Σ	σ, s	Sigma (sig - mah)
Φ	ϕ	Phi (fie) [some may say "fee"]
Ω	ω	Omega (oh - meg - ah)

Some of the more common and recognizable symbols:

$=$ Equals, is equal to $\neq$ Is not equal to

≅   Is approximately equal to   ∞   Infinity, a value never reached

×   ·   Times, multiplication of the two (or more) number values

÷   /   Divided by, or "ratio" or "rational number" meaning p/q

∴   Therefore. A biggy: If this is true, then therefore that must follow

√ means "take the square root of" or "the square root of"

sqrt(x) means take the square root of x

X < Y   X is less than Y

X > Y   X is greater than Y

X ≤ Y   X is less than or equal to Y (but not greater than Y)

X ≥ Y   X is greater than or equal to Y (but not less than Y)

≡   Is congruent to (comparison of two angles or other geometric shapes)

            All circles and squares are similar, but only congruent if they are exactly the same size. Two triangles can be similar (if they have the same three angles), or congruent (if they are exactly the same size).

Symbols used for number theory, set theory, and logic. Sets are easy. You have sets in your home: sets of dishes, sets of furniture, sets of tools, sets of tableware. The mathematics of sets is easy, but expertly made obscure by the mathematicians' astounding capacity to make simple concepts appear to be beyond the comprehension of ordinary people. We will intrude upon their game.

{*a, b, c, ...*}   The set whose elements are a, b, and c and so on

P ∧ Q   P and Q (each letter represents a set, condition, or quality)

P ∨ Q   P or Q

~ P   Not P

P → Q   If P, then Q, or P implies Q

P ↔ Q   Similar to P = Q, or P if and only if Q

{*x* | *x* has a certain property} The set of all x such that x has a certain property. For

example, the set of all dirty socks S, left on the bedroom floor by a mathematician could be expressed as: {S | S dirty socks on the floor}. Another example: the set of all numbers which are greater than the number symbolized by the letter V, could be expressed as: { n | n > V}. See how easy math is when you know the secret code.

$x \in A$ x is an element of the set A. For example: fork $\in$ tableware (A fork belongs to your set of tableware.) Another example: bra $\in$ women's underwear (Math can be exciting!) Another example: $\pi \in$ the set of irrational numbers. That means that Pi is one of the "irrational" numbers. In mathematics, the word "irrational" does not mean a person who is temporarily unreasonable, or permanently unreasonable, it means numbers that are *not rational*, which means numbers which cannot be expressed precisely in the *format of a ratio*. The format of a ratio is a division kind of relationship, symbolized as ÷ or more commonly as *p/q*. This statement, that Pi is not a rational number simply means that the number value of Pi, which is an endless non-repeating decimal (3.141592654...), cannot be expressed accurately in the form of one whole number divided by another whole number. Mathematicians use the capital letter *Q* as a symbol for the set of all rational numbers. Therefore we could use the following symbol to make a slightly different mathematical statement with the same meaning:

$x \notin A$ x is not an element of set A.

      Therefore, Pi is not a rational (ratio type of) number

      ... And, in mathematical symbols which we are describing here

      $\therefore \pi \notin Q$ means exactly the same thing as "Therefore, Pi is not a rational (ratio type of) number" in the ordinary spoken language of English. Take another look at those four symbols and SEE how simple it is to understand when you know what those symbols mean. This is a beginning example of how mathematicians make math obscure by using a secret code. Students are inclined to think that those four symbols have some arcane meaning that only a nerd from outer space can understand. But, when the symbols are explained, all they mean is: The number Pi (3.141592654...) which we know as the circumference of a circle that has a diameter that we designate as being equal to one (1), is a number that cannot be expressed accurately as one whole number divided by another whole number. We will do more of this clarification as we go along.

ϕ The empty set. In other words, a set of nothing.

$A \subseteq B$ Set A is a subset of set B. Dogs are a subset of mammals

$A \subset B$ Set A is a proper subset of B.

A'   The complement of set A

$n(A)$ The cardinal number of set A

$N = \{1,2,3,...\}$ The set of natural numbers

$W = \{0,1,2,3,...\}$ The set of whole numbers (just add 0 to N)

$J = \{..., -2,-1,0,1,2,...\}$ The set of integers (N, plus -N, plus 0)

Q (p/q) The set of rational (ratio types of) numbers

$A \cup B$ The union of set A and set B

$A \cap B$ The intersection of set A and set B

$A \times B$ The cartesian product of set A and set B

$a \cdot b$, $a \times b$, (a)(b), ab   The product (multiplication) of a times b

Permutations, combinations, and probability:

P(n,r)   The number of permutations of n elements taken r at a time

C(n,r)   The number of combinations of n elements taken r at a time

P(A)   The probability of A

So, if a child's brain is very smart at math, very good at math, he or she will begin to invent his or her own language for number processing, and that personal mathematical language will not be the same as the international cultural language that is accepted and *ENFORCED* by our usual social pressures to conform. Then, when the child is told, by adult authority "*SHOW YOUR WORK*" that does not mean show YOUR work the way that you do it, but it means SHOW THAT YOU ARE CONFORMING TO OUR ENFORCED WAY OF DOING THE MATH PROCESSING. This enforced conformity causes millions of math geniuses to lose interest in math and become artists, or poets, or truck drivers, or criminals. Further, when our simple members of Congress pose as patriots and say that they want our children to learn more math, they are blind and in the

dark because they do not know what they are talking about. All they are saying is that they want future generations to be just as conformist and stunted as the present generation. Which is essentially the true meaning of "patriotism." Patriotism means, literally, "love your father." Don't betray your father by challenging his viewpoint or by suggesting things can be done differently from his way. Patriotism means "don't change." Which is really very similar, linguistically, to saying "die." As crazy as it will sound to many, enforcing one mathematical language is a form of patriotism. It is enforced conformity in an institution whose members are deeply convinced that they are free because they are mathematicians.

If you really want to be free, you have to go back where there are only cows, and all turtles are one turtle. And you can process the numbers any way you like. Love. And, "show your work" will mean try to explain in your own words how you process numbers your way, not the way others process numbers. We are not going to tell you that there is only one way to draw a horse. Your horse is the horse we want to see.

-- End --