

7-1-1993

## A Fairy Tale: Being A Pseudo-History of Mathematics With Special Attention Given to The Evolution of the Number System

Peter Flusser  
*Kansas Wesleyan University*

Follow this and additional works at: <http://scholarship.claremont.edu/hmnj>



Part of the [Mathematics Commons](#)

---

### Recommended Citation

Flusser, Peter (1993) "A Fairy Tale: Being A Pseudo-History of Mathematics With Special Attention Given to The Evolution of the Number System," *Humanistic Mathematics Network Journal*: Iss. 8, Article 24.  
Available at: <http://scholarship.claremont.edu/hmnj/vol1/iss8/24>

This Open Educational Resource is brought to you for free and open access by the Journals at Claremont at Scholarship @ Claremont. It has been accepted for inclusion in Humanistic Mathematics Network Journal by an authorized administrator of Scholarship @ Claremont. For more information, please contact [scholarship@cuc.claremont.edu](mailto:scholarship@cuc.claremont.edu).

**A Fairy Tale:  
Being  
A Pseudo-History of Mathematics  
With Special Attention Given to  
The Evolution of the Number System**

**which humanistic professors of mathematics  
tell their students under the illusion  
that this will turn them into humanists**

*Peter Flusser  
Kansas Wesleyan University*

In the beginning the Mother of Mathematicians (MOM) created sets. But sets were without form and void, and darkness lay upon the face of the Universe of Discourse. And MOM said: "Let there be numbers" and there were natural numbers. For MOM created the natural numbers: all else is the work of MAN. But the natural numbers were without order and harmony. So MOM created the music of the spheres, but nobody could hear it. And MOM saw that all was good. And that was the evening and the morning of the new age of mathematics.

And Peano opened his mouth and said: "Let the Induction Axiom be postulated and let it be a BURDEN AND IMPEDIMENT TO LEARNING FOR MATHEMATICS STUDENTS who shall neither recall nor understand it."

And this was the first BURDEN AND IMPEDIMENT. And MOM saw that it was good for the induction axiom caused much weeping and gnashing of teeth among mathematics students.

And Peano defined addition and multiplication inductively on the natural numbers, and the natural numbers could always be added and multiplied, but they could only be subtracted and divided some of the time, but not all of the time. So MOM invented equivalence classes of pairs of integers. And she called them the set of rational numbers, but they were really fractions. That was the second BURDEN AND IMPEDIMENT for nobody likes fractions.

And MOM saw that the set of rationals was

good, for it was the smallest ordered field. But it was big enough for all practical purposes. And MOM opened her mouth and said to all peoples: "All numbers ye shall add and subtract and multiply, and by all numbers ye shall divide but by zero ye shall not divide. And this commandment I give unto you, and it shall be a commandment unto you and unto your posterity, even unto the last generation. And it shall be called the Eleventh Commandment: 'Thou shalt not divide by zero!' For whosoever shall divide by zero shall eat of the Fruit of the Tree of Infinity and of the Worm of Indeterminacy that liveth in the Fruit of the Tree of Infinity. And of that Worm and of that Fruit ye shall not eat lest errors and inconsistencies invade your work and ye shall be scorned and derided by your colleagues and successors forever." And that was the third BURDEN AND IMPEDIMENT, and MOM saw that it was good.

And it came to pass in those days that all ancient mathematicians lived contentedly somewhere in Greece, unless they lived in Egypt or Babylon. And they added and subtracted and multiplied and divided, but by zero they did not divide because the Greeks did not have zero. But the Babylonians did perhaps have zero, but they did not divide by zero because the Babylonians did not divide: they multiplied by reciprocals, and this was indeed a sign and a mark of distinction between Babylonians and Amoebas, for whereas Amoebas multiply by dividing, Babylonians divided by multiplying. Now the Babylonians might have invented zero, or they might have obtained it from the Indians or the Chinese, for there lived ancient mathematicians in ancient India

and in ancient China; but in modern Western books ancient Chinese and ancient Indian mathematicians do not live; except that the ancient Chinese Remainder Theorem, and the ancient Indian mathematicians are credited with inventing the modern Arabic numerals.

At this time there lived in Crotona, on the toe of the boot of Italy, a set of Greek mathematicians known as Pythagoreans, who made Music and Mathematics as MOM commanded. The Pythagoreans saw music in mathematics and mathematics in music. For when the strings of their lyres were as the ratios of small numbers the sounds produced were becoming and harmonious, but if the ratios were not so, then the sounds came forth that were harsh and grating. When the Pythagoreans saw these things there saw that numbers were very good and they opened their mouths and said: "All is number!"

And it came to pass in those days that MOM said unto Pythagoras, the Lord of the Pythagoreans: "Come up to me unto the mount and be there: and I will give thee a tablet of clay, which the Babylonians have written; that thou mayest teach it." And Pythagoras rose up and girded his loins and went up into the mount and MOM delivered the tablet unto him. And lo! there were inscribed upon the tablet fifteen sets of Pythagorean triples. And the name of the tablet was Plimpton 322. And when Pythagoras saw the tablet he rejoiced exceedingly with a great joy, and opening his mouth he said: "This shall be known as the Theorem of Pythagoras, for verily, verily I say to you: Unless you know that  $a^2+b^2=c^2$  you cannot enter Plato's academy." And this was not a BURDEN AND IMPEDIMENT, and so MOM's anger waxed exceedingly hot.

And so it came to pass that there lived in Metapontum a Pythagorean Blabbermouth, and he came to Pythagoras and said: "Master, thy theorem implies that the square root of two is not a number. Neither is it a ratio of numbers. It is a surd." And Pythagoras' anger waxed hot and he cast Plimpton 322 out of his hands and he brake it upon the ground. For this was indeed the fourth BURDEN AND IMPEDIMENT. And then Pythagoras opened up his mouth and said unto the Blabbermouth: "Verily thou hast said it. But proclaim not this message to the people lest thou leadeth them into confusion, for they think that a

surd is absurd."

But MOM darkened the Blabbermouth's mind, and he kept opening his blabber mouth and blabbered to one and all. And thus he confused the people. So MOM made a big fish, and the big fish came to the Blabbermouth and opened its mouth and said "Gulp!" and swallowed the Blabbermouth. And MOM was well pleased.

And then there came Theaetetus and Democritus and they fixed up the number system and called it R because it was real even though Plato and all Platonist mathematicians, in other words, almost all mathematicians, that is all mathematicians except for a set of measure zero, said that R is a mental concept and hence ideal and not real. And Euclid wrote it all down in Book X of his "Elements", and Book X was the fifth BURDEN AND IMPEDIMENT for nobody could read it. And MOM saw that this was good.

But the Romans did not like BURDEN AND IMPEDIMENTS. So they conquered the Greeks and there fell upon the earth a thousand years of darkness when there was no light to do mathematics by. The old mathematics was forgotten, and Euclid I.5 was called the PONS ASINORUM, the bridge of asses, because you could not cross that bridge and understand Euclid I.5 while sitting on your donkey.

But the Arabs had light in those days, for they invented Algebra and brought Arabic numerals to the Darkened West. And there came Omar Khayyam, and he opened up his mouth and said:

"A book of verses underneath the sky,  
A loaf of bread, a jug of wine, and I  
Can solve the cubic, if I try!"

And Omar, the poet and algebraist, solved the cubic geometrically.

But Cardano, the sooth-sayer, Tartaglia, the stutterer, and other Italian geometers solved the cubic algebraically. For after thousand years of darkness there came the light of the Renaissance and all men could see what the Ancients had done. And the light brought Fermat and he discovered the Last Theorem. And when MOM saw that Fermat may have proved the Last Theorem she opened her mouth and said: "Truly if Fermat proveth the Last Theorem then woe be unto me and unto all mathematicians for there shall be naught left for us to do and we shall suffer death from boredom."

So MOM sent an angel to shrink the margins of Diophantus' book so that Fermat could not write the proof there. And she sent guardian angels with flaming swords to guard the proof from all generations even unto this day so that no one might rediscover it. And Fermat write in the margin of Diophantus' book: "Behold! I have discovered something the ancients did not know: the margins of Diophantus' book are too small to write in."

And then came Descartes, and he stayed in bed even in the light of the Renaissance, for Descartes, the soldier of fortune, was weak and infirm. And Descartes opened his mouth and said: "Cogito ergo sum!" And then he got out of bed to teach Queen Christina Analytic Geometry and caught cold and died. And then Newton stood on the shoulders of giants and played with pebbles on the shore of the unexplored ocean and discovered the Calculus, and then Leibniz invented the Calculus and Newton and Leibniz fought over who discovered this, and who invented that, and who copied from whom, and what it all means, and Newton lost the argument and therefore British mathematicians did not know how to use Leibniz's notation. But Euler did know how to use that notation, and he discovered lots of mathematics and he made lots of mistakes and so Cauchy, Bolzano and Weierstrass opened their mouths and said: "Mathematics is like a house without a foundation built upon sand, against which series and infinitesimals beat vehemently, and immediately it falls and the ruins of that house are great. So let us dig deep and lay a foundation for mathematics on the rock of the real numbers: then series and infinitesimals cannot shake it."

And there came a Wise but Unknown Mathematician and he opened his mouth and said: "The real numbers are infinite decimals." And that made sense, and it was not a BURDEN AND IMPEDIMENT and students did not weep nor did they gnash their teeth. And MOM saw that this was not good. So MOM made Cantor and he opened his mouth and said: "Real numbers are equivalence classes of Cauchy sequences." And MOM also made Dedekind who, opened his mouth, said: "The real numbers are Dedekind Cuts." And there came Shakespeare and he said unto Dedekind: "That's the most unkindest cut of all." For this was the sixth BURDEN AND

IMPEDIMENT. And MOM saw that this was good, for now mathematics students came unto MOM and said unto her: "What is a real number, really?"

And MOM said: "The real numbers are a complete ordered field, and all complete ordered fields are order-isomorphic so that there is only one complete ordered field; Cantor and Dedekind and the Wise Mathematician notwithstanding. And that is good." For this was the seventh BURDEN AND IMPEDIMENT. And it should have been the last BURDEN AND IMPEDIMENT, for on the seventh BURDEN AND IMPEDIMENT, MOM wanted to rest.

Yea verily, this should be the end of the story except for Gauss, who discovered the complex numbers, which are ordered pairs of real numbers and which Gauss discovered before the real numbers were invented. Only Wessel and Argand invented the complex numbers before Gauss discovered them, which is strange because usually Gauss discovered things before other people invented them. But then Gauss discovered non-Euclidean geometry before Bolyai and Lobachevski invented it, and that was important but also sad, because before the discovery of non-Euclidean Geometry mathematicians had been SEEKERS OF TRUTH, but after this invention they became hewers of wood and DRAWERS OF NECESSARY CONCLUSIONS FROM ARBITRARY ASSUMPTIONS and therefore FORMAL MANIPULATORS OF MEANINGLESS SYMBOLS.

And then came Gödel, and he opened his mouth and said: "You cannot prove that the axioms of a complete ordered field are complete or consistent or categorical. So the foundation of mathematics is indeed built upon sand." And this was a BURDEN AND IMPEDIMENT FOR ALL MATHEMATICIANS. And when Hilbert heard of this BURDEN AND IMPEDIMENT he tore his clothes, covered his head with ashes, wrapped himself in sack-cloth and retired from mathematics. And this was not good. So MOM transformed all mathematicians into humanists who can overcome most BURDEN AND IMPEDIMENTS. And this was very good, and so everyone lived happily ever after.