STRANGE ATTRACTORS: MATHEMATICS AND LITERATURE

Humanistic Mathematics:

A movement in mathematics that explores the interconnections between mathematics and the humanities (art, music, literature)

Adventures of Huckleberry Finn, Mark Twain,1884, from Chapter 4

I had been to school most all the time, and could spell, and read, and write just a little, and could say the multiplication table up to six times seven is thirty-five, and I don't reckon I could ever get any further than that if I want to live forever. I don't take no stock in mathematics, anyway.

"An Old Arithmetician", Mary E. Wilkins, 1885, from Harper's New Monthly Magazine

Well, it come into my head this forenoon what a blessed privilege it would be to count up all the beautiful things in this creation. Just think of countin' all them red an' gold-colored leaves, an' all the grapes an'apples in the fall; an' when it come to the winter, all the flakes of snow, an' the sparkles of frost; an' when it comes to the spring, all the flowers , an' blades of grass, an' the little new light green leaves. I don't know but you'll think it ain't exactly reverent, but it does seem to me that I'd rather do that than sing in the other world.

The Man Who Counted, Malba Tahan, 1972, from Chapter 14

It is important to bear in mind that mathematics, besides solving problems, calculating areas, and measuring volumes, also possesses much more elevated purposes. Because it is so valuable in the development of intelligence and reason, mathematics is one of the surest ways for a man to feel the power of thought and the magic of the spirit. Mathematics is…one of the eternal truths and, as such, raises the spirit to the same level on which we contemplate the great spectacles of nature and on which we feel the presence of God, eternal and omnipotent.

A Certain Ambiguity, Gaurav Suri and Hartosh Singh Bal, 2007, from Chapter 1

"If mathematics is so beautiful, why haven't I ever heard anyone talk about it that way before?"...
"I'm not sure...Maybe it's because mathematics is not a spectator sport. You have to do it to appreciate it, and doing it requires patience and persistence. You can love a song without being able to sing, but that doesn't work in mathematics. Nevertheless, the beauty is there for you to find."

The French Mathematician, Tom Petsinis, 1997, from Chapter 6

Thinking about mathematics is never a waste of time, he says with conviction. Like prayer and meditation, it raises the spirit from wasteful passions, material pursuits, and the present political madness…The unenlightened fail to see that mathematics is spiritual in its essence.

Gulliver's Travels, Jonathan Swift, 1726, from Part III, A Voyage to Laputa

Their Houses are very ill built, the Walls bevil, without one right Angle in any Apartment; and this Defect ariseth from the Contempt they bear for practical geometry; which they despise as vulgar and mechanick…

I was at the Mathematical School, where the Master taught his Pupils after a Method scarce imaginable to us in Europe. The Proposition and Demonstration were fairly written on a thin Wafer, with ink composed of a Cephalick Tincture. This the Student was to swallow upon a fasting Stomach, and for three Days following eat nothing but Bread and Water. As the Wafer digested, the Tincture mounted to his brain, bearing the Proposition along with it. But the Success hath not hitherto been answerable, partly by some Error in the Quantum or Composition, and partly by the Perverseness of Lads; to whom this Bolus is so nauseous, that they generally steal aside, and discharge it upwards before it can operate; neither have they been yet persuaded to use so long an Abstinence as the Prescription requires.

A Tree Grows in Brooklyn, Betty Smith, 1943, from Chapter XXII

"She liked numbers and sums. She devised a game in which each number was a family member and the "answer" made a family grouping with a story to it. Naught was a babe in arms. He gave no trouble. Whenever he appeared you just "carried" him. The figure 1 was a pretty baby girl just learning to walk, and easy to handle; 2 was a baby boy who could walk and talk a little. He went into family life (into sums, etc.) with very little trouble. And 3 was an older boy in kindergarten, who had to be watched a little. Then there was 4, a girl of Francie's age. She was almost as easy to "mind" as 2. The mother was 5, gentle and kind. In large sums she came along and made everything easy the way a mother should. The father, 6, was harder than the others but very just. But 7 was mean. He was a crotchety old grandfather and not at all accountable for how he came out. The grandmother, 8, was hard too, but easier to understand than 7. Hardest of all was 9. He was company and what a hard time fitting *him* into family life!

When Francie added a sum, she would fix a little story to go with the result. If the answer was 924, it meant that the little boy and girl were being minded by company while the rest of the family went out. When a number such as 1024 appeared it meant the little children were playing together in the yard. The number 62 meant papa was taking the little boy for a walk; 50 meant that mama had the baby out in the buggy for an airing and 78 meant grandfather and grandmother sitting home by the fire of a winter's evening. Each single combination of numbers was a new set-up for the family and no two stories were ever the same.

Francie took the game with her up into algebra. X was the boy's sweetheart who came into the family life and complicated it. Y was the boy friend who caused trouble. So arithmetic was a warm and human thing to Francie and occupied many lonely hours of her time."

Smilla's Sense of Snow, Peter Hoeg, 1992, from Part I, Chapter 7 and from Part 2, Chapter 1

"It's easier for me to be interested in mathematics than to have affection for my fellow human beings.."

"If anyone asked me what makes me truly happy, I would say: numbers. Snow and ice and numbers."

The Solitude of Prime Numbers, Paolo Giardano, 2008, from Chapter 21

Prime numbers are divisible only by 1 and by themselves. They hold their place in the infinite series of natural numbers, squashed, like all numbers, between two others, but one step further than the rest. They are suspicious, solitary numbers, which is why Mattia thought they were wonderful. Sometimes he thought that they had ended up in that sequence by mistake, that they'd been trapped, like pearls strung on a necklace. Other times he suspected that they too would have preferred to be like all the others, just ordinary numbers, but for some reason they couldn't do it...

...among prime numbers, there are some that are even more special. Mathematicians call them twin primes: pairs of numbers that are close to each other, almost neighbors, but between them there is always an even number that prevents them from truly touching. Numbers like 11 and 13, like 17 and 19, 41 and 43...

Mattia thought that he and Alice were like that, twin primes, alone and lost, close but not close enough to really touch each other.

Far From the Madding Crowd Thomas Hardy, 1874, from Chapter XV

Indeed, he (the elderly maltster) seemed to approach the grave as a parabolic curve approaches a line – sheering off as he got nearer till it was doubtful if he would ever reach it at all.

The Life and Opinions of Tristram Shandy, Gentleman, Laurence Sterne, 1760-1767, from Volume 4, Chapter XIII

"I am this month one whole year older than I was this time twelve-month…and having got…almost into the middle of my 4th volume – and no farther than my first day's life – 'tis demonstrative that I have 364 days more life to write just now, than when I first set out…so that instead of advancing…I shall never overtake myself."

Tristram Shandy Paradox – invented by Bertrand Russell (1872 – 1970). The book can be finished if we assume Tristram Shandy lives an infinite number of days instead of a finite number of days. An infinite subset of a countable infinite set has the same size as the entire set.

Mrs. Miniver, Jan Struther, 1939, from "A Country House Visit"

She saw every relationship as a pair of intersecting circles. The more they intersected, it would seem at first glance, the better the relationship; but this is not so. Beyond a certain point the law of diminishing returns sets in, and there aren't enough private resources left on either side to enrich the life that is shared. Probably perfection is reached when the area of the two outer crescents, added together, is exactly equal to that of the leaf-shaped piece in the middle. On paper there must be some neat mathematical formula for arriving at this: in life, none.

Mrs. Miniver's Problem: Given a circle *A*, find a circle *B* such that the area of the intersection of *A* and *B* is equal to the area of the symmetric difference of *A* and *B.*

War and Peace, Leo Tolstoy, 1869, from Book3, Part 3, Chapter 1
Tolstoy's proposal of a differential and integral analysis of history

A new branch of mathematics, having attained the art of reckoning with infinitesimals, can now yield solutions to other more complex problems of motion which before seemed insoluble. This new branch of mathematics, which was unknown to the ancients, by admitting the conception, when dealing with problems of motion, of the infinitely small and thus conforming to the chief condition of motion (absolute continuity), corrects the inevitable error which human intellect cannot but make if it considers separate units of motion instead of continuous motion. In the investigation of the laws of historical movement precisely the same principle operates.

The march of humanity, springing as it does from an infinite multitude of individual wills, is continuous. The discovery of the laws of this continuous movement is the aim of history. But to arrive at these laws of continuous motion resulting from the sum of all those human volitions, human reason postulates arbitrarily, separated units. The first proceeding of a historian is to select at random a series of successive events and examine them apart from others, though there is and can be no beginning to any event, for an event flows without break in continuity from another.

The second method is to study the actions of some one man – a king or commander – as though their actions represented the sum of many individual wills; whereas the sum of the individual wills never finds expression in the activity of a single historical personage.

…Only by assuming an infinitesimally small unit for observation – a differential of history (that is, the common tendencies of men) – and arriving at the art of integration (finding the sum of the infinitesimals) can we hope to discover the laws of history.

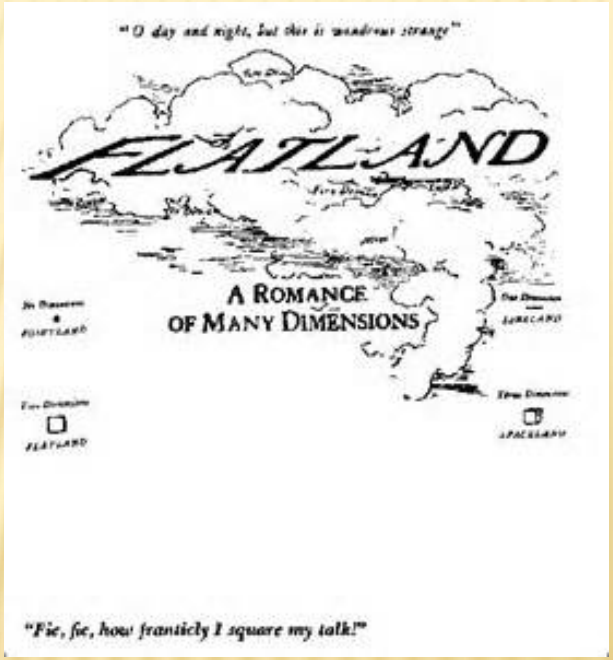
The Brothers Karamazov, Fyodor Dostoevsky, 1880, from Book V Chapter 3

"(God created the world) according to the principles of Euclidian geometry and made the human brain capable of grasping only three dimensions of space. Yet there have been and still are mathematicians and philosophers – among them some of the most outstanding – who doubt that the whole universe or, to put it more generally, all existence was created to fit Euclidian geometry; they even dare to conceive that two parallel lines that, according to Euclid, never meet on earth do, in fact, meet somewhere in infinity. And so, my dear boy, I've decided that since I'm incapable of understanding even that much, I cannot possibly understand about God. I humbly admit that I have no special talent for coping with such problems, that my brain is an earthly, Euclidian brain, and that therefore I'm not properly equipped to deal with matters that are not of this world. And I would advise you too, Alyosha, never to worry about these matters, least of all about God – whether He exists or not. All such problems are quite unsuitable for a mind created to conceive only three dimensions."

Life on the Mississippi, Mark Twain, 1883, from Chapter XVII

In the space of one hundred and seventy six years the Lower Mississippi has shortened itself two hundred and forty-two miles. That is an average of a trifle over one mile and a third per year. Therefore, any calm person, who is not blind or idiotic, can see that in the Old Oolitic Silurian Period, just a million years ago next November, the Lower Mississippi River was upward of one million three hundred thousand miles long, and stuck out over the Gulf of Mexico like a fishing rod. And by the same token any person can see that seven hundred and forty two years from now the Lower Mississippi will be only a mile and three-quarters long, and Cairo and New Orleans will have joined their streets together, and be plodding comfortably along under a single mayor and a mutual board of aldermen. There is something fascinating about science. One gets such wholesome returns of conjecture out of such a trifling investment of fact.

Flatland, Edwin Abbott Abbott, 1884



Math in Science Fiction and Horror Genres (especially concepts of higher dimensions and non-Euclidian geometry)

Authors that have used math in science fiction: H.G. Wells, Arthur C. Clarke, Isaac Asimov, Carl Sagan

Author that has concepts of higher dimensions in horror: H.P. Lovecraft (“Dreams in the Witch House” and “The Call of Cthulhu”)

Mathematics in Literature for Children and Young Adults

The Phantom Tollbooth – Norton Juster

The Dot and the Line – Norton Juster

The Number Devil – Hans Magnus Enzensberger

The Man Who Counted - Malba Tahan

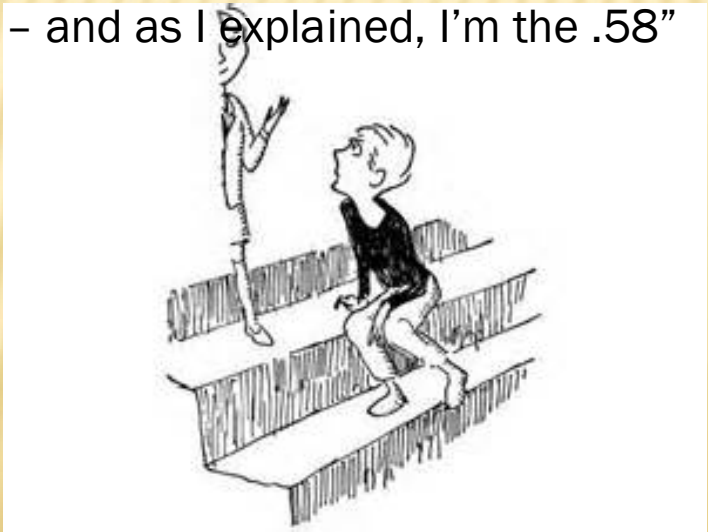
A Wrinkle in Time – Madeleine L'Engle

The Phantom Tollbooth, Norton Juster, 1961, from Chapter 14

"What's a Dodecahedron?" inquired Milo, who was barely able to pronounce the strange word.
"...A Dodecahedron is a mathematical shape with twelve faces."
Just as he said it, eleven other faces appeared, one on each surface, and each wore a different expression.

The Phantom Tollbooth, Norton Juster, 1961, from Chapter 16

Standing next to him on the step was exactly one half of a small child who had been divided neatly from top to bottom.
“Pardon me for staring,” said Milo, after he had been staring for some time, “but I’ve never seen half a child before.”
“It’s .58 to be precise,” replied the child from the left side of his mouth (which happened to be the only side of his mouth).
“What is the rest of your family like?” said Milo…
”Oh, we’re just the average family…mother, father, and 2.58 children – and as I explained, I’m the .58”



Historical/Biographical Fiction about Famous Mathematicians

The French Mathematician – Tom Petsinis (about Evariste Galois)

The Indian Clerk – David Leavitt (about Srinivasa Ramanujan, G.H. Hardy, and John Littlewood)

The Sand Reckoner – Gillian Bradshaw (about Archimedes)

Beyond the Limit – Joan Spicci (about Sofya Kovalevsky)

Mathematics, Mystery, Murder, and Mayhem!!!

The Oxford Murders – Guillermo Martinez

The Square Root of Murder – Ada Madison

Pythagorean Crimes – Tefcros Michaelides

The Fractal Murders – Mark Cohen

Strangler Figs – Peggy Brown

Novels whose main purpose is to educate the reader about math concepts:

Math Girls – Hiroshi Yuki

The Parrot's Theorem – Denis Guedj

A Certain Ambiguity – Gaurav Sari and Hartosh Sinh Bal

Surreal Numbers – Donald Knuth

The Two Cultures, C.P. Snow, 1959

Brought to prominence the idea that our society, including its educational system, is characterized by a split between two cultures:
Humanities and the arts
Sciences and mathematics

STRANGE ATTRACTORS: LITERARY MATHEMATICIANS

Geoffrey Chaucer (1343 – 1400)

Chaucer is sometimes called the Father of English Literature and is most famous for The Canterbury Tales.

Chaucer also wrote Treatise on the Astrolabe which is often cited as the first example of technical writing in the English language and the oldest English work describing a complex scientific instrument.

An astrolabe is used by astronomers and navigators to predict the positions of the sun, moon, stars, and planets and to determine local time based on latitude. The astrolabe is also mentioned in The Canterbury Tales in “The Franklin’s Tale.”

Chaucer was versed in mathematics and science in addition to his literary talents.

Johannes Kepler (1571 – 1630)

Kepler was a German mathematician and astronomer, famous for his Laws of Planetary Motion. He wrote the astronomical works Astronomia Nova and Harmonice Mundi.

Kepler wrote a science fiction novel called Somnium. He began work on it in 1608 and did more work on it just before his death. It was the last book on which he worked. It was not published until 1634 by Kepler's son, Ludwig Kepler. The novel is about a dream of a journey to the moon and includes a detailed imaginative description of how the earth might look when viewed from the moon. Carl Sagan and Isaac Asimov have referred to it as the first work of science fiction in the modern sense.

Blaise Pascal (1623 – 1662)

Pascal was a French mathematician and Christian philosopher. He made mathematical contributions in the fields of projective geometry and probability theory. He constructed a mechanical calculator before the age of 19.

Through correspondence with mathematician Pierre de Fermat, Pascal addressed the subject of gambling. Their collaboration gave birth to the mathematical field of probability theory.

He is also noted for his experiments with the barometer, an instrument used to measure air pressure. The pascal, the unit used to measure atmospheric pressure and defined as one Newton per square meter, is named after him.

All of his mathematical and scientific research came to end in 1650, when, suffering from frail health, he decided to abandon his researches in math and science and to devote his life to religious contemplation. He returned to mathematics only once, in 1658. While suffering a toothache, some geometrical ideas occurred to him and his tooth stopped hurting. Taking this as a sign of divine will, he applied himself over the next several days to developing a full account of the geometry of the cycloid curve.

He has been described as the greatest “might have been” in the history of mathematics.

After his religious conversion, he devoted himself to writing literary works on Christian philosophy and religion.

He wrote The Provincial Letters to address controversy between the Jansenists and the Jesuits.

His most famous work is Pensees (literally “thoughts”), published posthumously. It consists of fragments on philosophy and theology and is considered to be a landmark in French literature. It includes a discussion of what is known as Pascal’s Wager.

From Pensees 418 “The Wager”
“Let us weigh up the gain and the loss involved in calling heads that God exists. Let us assess the two cases: if you win you win everything, if you lose you lose nothing. Do not hesitate then; wager that he does exist.”

For after all what is man in nature? A nothing in relation to infinity, all in relation to nothing, a central point between nothing and all and infinitely far from understanding either. The ends of things and their beginnings are impregnably concealed from him in an impenetrable secret. He is equally incapable of seeing the nothingness out of which he was drawn and the infinite in which he is engulfed.

Blaise Pascal, *Pensées* No. 199

British poet Samuel Taylor Coleridge (1772-1834) best known for The Rime of the Ancient Mariner wrote a letter to his brother Rev. George Coleridge. The letter included a poem that describes Proposition 1 of Book 1 of Euclid's Elements. Coleridge claimed it was part of a project to reproduce all of Euclid's Elements in a series of Pindaric odes ("I have often been surprised that mathematics, the quintessence of truth, should have found admirers so few…") .The project was apparently not pursued further.

From “A Mathematical Problem “ (Samuel Taylor Coleridge)

This is now – this was erst,
Proposition the first – and Problem the first.
On a given finite line
Which must no way incline;
To describe an equi-
Lateral tri-
A,N,G,L,E.
Now let A,B
Be the given line
Which must no way incline;
The great Mathematician
Makes this requisition,
That we describe an equi-
lateral tri-
angle on it:
Aid us, Reason – aid us, Wit!

From the centre A, at the distance A,B,
Describe the circle B,C,D…

Sofia Kovalevsky (1850 – 1891)

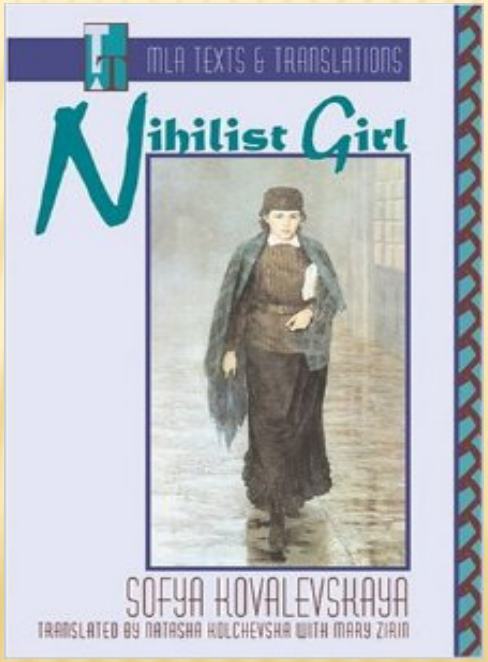
Kovalevsky was the first woman in Europe to earn a Doctorate in Mathematics. She made important contributions to analysis, mechanics, and differential equations. She has been described as "perhaps the most dazzling mathematical genius to surface among women during the past two centuries." She was Russian.

She was also a novelist. Her struggle for an education had made her a strong advocate of women's rights, and much of her literary work centered on this theme.

Her most famous work is Nihilist Girl, first published in 1892. "Nihilist" was a term used to describe radicals in Russia in the 1860s - they emphasized individual growth and education.

Nihilist Girl is the story of Vera Barantsova, a young aristocrat who wants to devote her life to a cause.

Kovalevsky's other writings consist of a childhood memoir, unpublished poetry and stories, and a play.



"...all my life I have been unable to decide for which I had the greater inclination, mathematics or literature. As soon as my brain grows wearied of purely abstract speculation, it immediately begins to incline to observations on life, to narrative, and vice versa, everything in life begins to appear insignificant and uninteresting, and only the immutable laws of science attract me. It is very possible that I should have accomplished more in either of these lines, if I had devoted myself exclusively to it; nevertheless, I cannot give up either of them completely."

Sofia Kovalevsky

Victorian Poet Scientists

Some Victorian scientists would go to social clubs where they would "recite and indeed sing songs they had written."

The scientific journal Nature, first published in Britain in 1869, regularly published verse under its first editor Norman Lockyer.

William Rowan Hamilton (1805 – 1865) was an Irish mathematician famous for his system of quaternions – a number system that extends the complex numbers and applies to mechanics in three dimensional space.

He had a lifelong desire to write poetry and wrote “it would really seem to have been at one time a toss-up, whether I should turn out a rhymer or an analyst.” He was very good friends with the great poet William Wordsworth.

He described his quaternions as the “offspring of geometry, algebra, metaphysics and poetry.”

When he decided to pursue mathematics professionally, he wrote a poem “To Poetry” with a request that the poetic muse not abandon him ‘though my life be now/ Bound to thy sister Truth by solemn vow.’

He continued to write poetry privately for the rest of his life.

James Joseph Sylvester (1814 – 1897)

Sylvester was an English mathematician who made contributions to the studies of matrix theory, number theory and combinatorics. He was professor at the University of Virginia, at Johns Hopkins University and at Oxford. Florence Nightingale was one of his private students.

Sylvester had a lifelong passion for poetry.

He published the book The Laws of Verse in which he wrote about laws of metrical structure in poetry. In this book, he broke poetry into pneumatic, linguistic and rhythmic aspects (ideas, words, and sounds). Out of the rhythmic aspect, he created qualities he called metric, chromatic, and synectic. He split synectic into phonetic syzygy, symptosis, and anastomosis. His system has been called “virtually unintelligible.” Sylvester had a very high regard for this work.

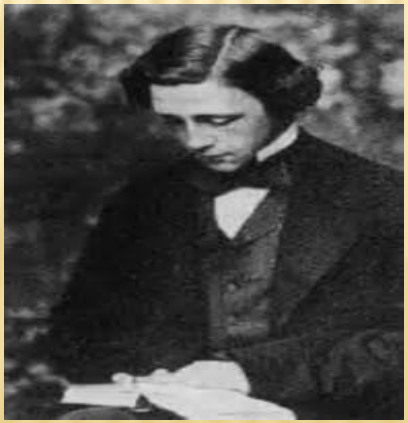
Sydney Lanier, in The Science of English Verse (1880) praises Sylvester’s ideas in The Law of Verse “as to be a genuine contribution to the nomenclature of the science of English verse.”

Lewis Carroll

Lewis Carroll (1832 – 1898) was the pen name of Charles Lutwidge Dodgson (pronounced “Dodson”), an English writer, mathematician, and logician. He held a Mathematical Lectureship at Christ Church College of Oxford University for 26 years. He was also a Deacon of the Church of England.

He was also considered one of the most important photographers of the nineteenth century and one of the earliest to consider photography as an art form rather than simply as a means of recording images. He is primarily remembered for his images of children.

He may have been the first to use recreational topics as a vehicle for teaching serious mathematical ideas.



His most important algebra book was An Elementary Treatise on Determinants, with their Application to Simultaneous Linear Equations and Algebraic Geometry. He broke new ground by discovering a method to evaluate determinants of square matrices called the Method of Condensation or Dodgson's Condensation.

A well-known story: Queen Victoria was charmed by Alice's Adventures in Wonderland and demanded that the next book that Lewis Carroll wrote be sent to her. The new book arrived. It was An Elementary Treatise on Determinants. It is said that "Queen Victoria was not amused." Dodgson denied that this story was true.

Pillow Problems

A collection of 72 problems “having been solved, in the head, while lying awake at night”. He claimed that working on these problems helped him endure insomnia – so these are problems for insomniacs. “An hour of calculation is much better for me than half an hour of worry.”

The problems mostly involve algebra, geometry, and trigonometry.

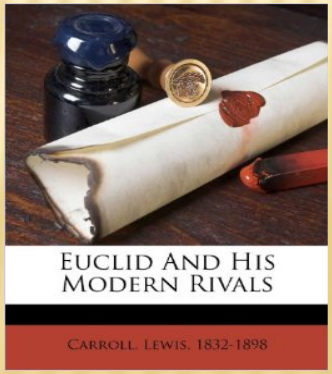
#5

A bag contains one counter, known to be either white of black. A white counter is put in, the bag shaken, and a counter is drawn out, which proves it to be white. What is now the chance of drawing a white counter? (Answer: 2/3)

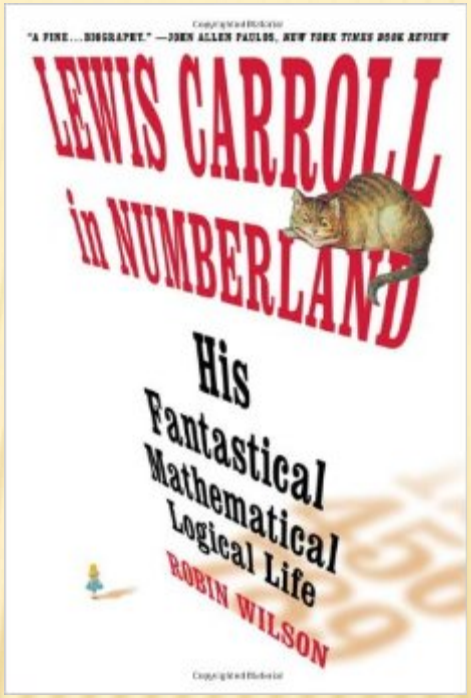
Euclid and His Modern Rivals

Euclid's Elements is one of the most important mathematical texts ever written. It was written around 300 BC and has been the foundation for teaching geometry for centuries. It is admired for training students how to reason and to think logically.
Dodgson was an outspoken advocate of using Euclid's Elements in the teaching of geometry and was bitterly opposed to reforms in the teaching of mathematics and geometry which viewed traditional education as irrelevant.

In Euclid and His Modern Rivals, Dodgson compared Euclid's Elements with thirteen rival textbooks, concluding that Euclid was far superior to the rival books. It is presented as a play in four acts! The curtain rises on a college study at midnight…



Lewis Carroll in Numberland: His Fantastical Mathematical Logical Life by Robin Wilson, W.W. Norton and Company, 2008.



Piet Hein (1905 – 1996)

Hein was a Danish scientist, mathematician and poet.

He proposed the use of the superellipse curve in Scandinavian architecture and furniture making and devised the mathematical games of the Soma cube and Hex among others.

In poetry, he is famous for his short aphoristic poems called grooks. He wrote over 7000 of them. Many of his grooks were written during the Nazi occupation of Denmark during which time he was a member of the Danish resistance movement. The grooks were meant as a coded form of passive resistance and spirit building.

Grooks by Piet Hein

THE EGOCENTRICS

People are self-centered
to a nauseous degree.
They will keep on about themselves
while I'm explaining me.

THOUGHTS ON A STATION PLATFORM

It ought to be plain
how little you gain
by getting excited
and vexed.

You'll always be late
for the previous train,
and always in time
for the next.

Modern Literary Mathematicians:

Rudy Rucker: White Light (1980) and Mathematicians in Love (2006)

Alex Kasman: Reality Conditions: Short Mathematical Fiction (2005)

Colin Adams: Riot at the Calculus Exam and Other Mathematically Bent Stories (2009)

Ian Stewart: Flatterland (2001)

JoAnne Growney – taught math at Bloomsburg University

http://joannegrowney.com/

http://poetrywithmathematics.blogspot.com/
Blog: Intersections – Poetry with Mathematics

Sarah Glaz – Professor of Mathematics at the University of Connecticut

http://www.math.uconn.edu/~glaz/

Strange Attractors: Poems of Love and Mathematics, 2008
Edited by Sarah Glaz and JoAnne Growney

Misunderstanding by JoAnne Growney

Ah, you are a mathematician,
they say with admiration
or scorn.

Then, they say,
I could use you
to balance my checkbook.

I think about checkbooks.
Once in a while
I balance mine,
just like sometimes
I dust high shelves.

Crossing the Equal Sign – Marion Deutsche Cohen

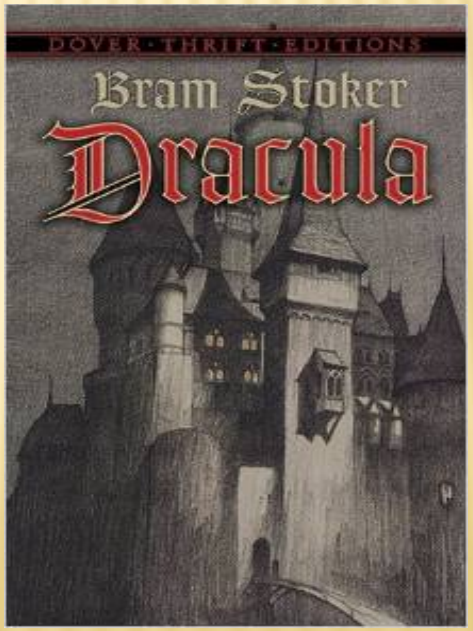
You can draw pictures without analytic geometry.
Straight lines don't need ax + b.
Circles don't need x-square plus y-square.
Loops and scallops don't need polar coordinates.
But they wouldn't be as pretty.
They're prettier with axes running through them and equations running along them.
Spirals aren't as pretty without theta.
Four-leaf clovers aren't as pretty without sin-square theta.
Beauty isn't as pretty without the truth.

Literary Figures with Mathematics Degrees

Bram Stoker (1847 - 1912)

Dracula (1897)

BA in mathematics from Trinity College, Dublin

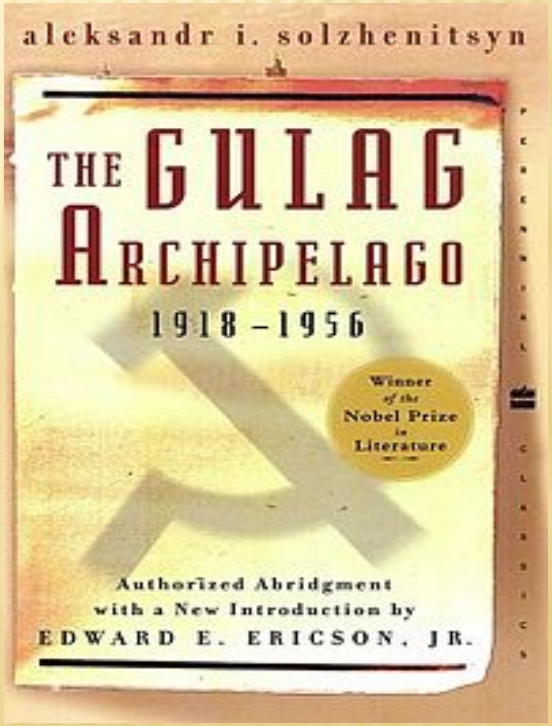


Alexander Solzhenitsyn (1918 - 2008)

Gulag Archipelago (1973)

Nobel Prize in Literature 1970

Degree in mathematics and physics from the University of Rostov

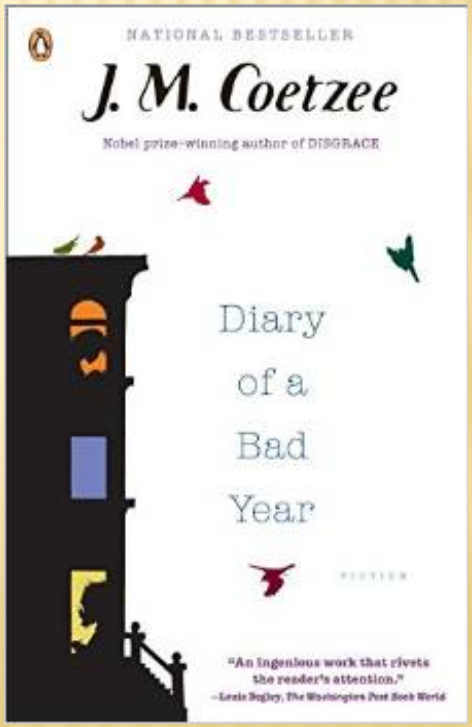


J.M. Coetzee (1940 -)

Diary of a Bad Year (2007)

Nobel prize in Literature 2003

BA in mathematics from University of Cape Town



“Imagination and mathematics are not contradictory; they complement one another like lock and key.” – Jorge Luis Borges

Mathematical Fiction

Alex Kasman (College of Charleston)

http://kasmana.people.cofc.edu/MATHFICT

THANK YOU!

James (Chip) Galloway
Professor of Mathematics
Collin College

cgalloway@collin.edu