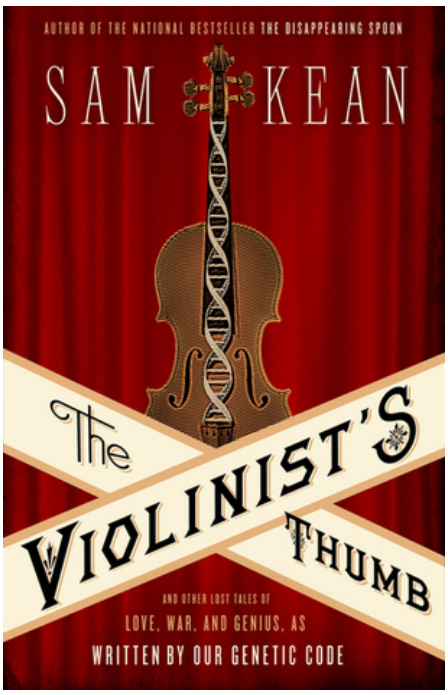

The Violinist's Thumb: And Other Lost Tales of Love, War, and Genius, as Written by Our Genetic Code

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In *The Disappearing Spoon*, bestselling author Sam Kean unlocks the mysteries of the periodic table. In *The Violinist's Thumb*, he explores the wonders of the magical building block of life: DNA.

There are genes to explain crazy cat ladies, why other people have no fingerprints, and why some people survive nuclear bombs. Genes illuminate everything from JFK's bronze skin (it wasn't a tan) to Einstein's genius. They prove that Neanderthals and humans bred thousands of years more recently than any of us would feel comfortable thinking. They can even allow some people, because of the exceptional flexibility of their thumbs and fingers, to become truly singular violinists. Kean's vibrant storytelling makes science entertaining, explaining human history and whimsy while showing how DNA will influence our species' future.

The Violinist's Thumb: And Other Lost Tales of Love, War, and Genius, as Written by Our Genetic Code Details

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From Reader Review The Violinist's Thumb: And Other Lost Tales of Love, War, and Genius, as Written by Our Genetic Code for online ebook

Jimmy says

The author's parents were named Gene and Jean. That's right: Gene and Jean Kean. What else could their son do but write a book about genetics? And a fun book it is, with some fascinating stories.

There is enough DNA in a human body to stretch from Pluto to the sun and back. There's enough DNA on earth to stretch across the known universe many, many times.

Fruit fly genes have fun names, such as groucho, smurf, fear of intimacy, lost in space, smellblind, faint sausage, tribble (from the Star Trek episode), and tinman (if mutated, can prevent fruit flies from growing a heart). A mutant armadillo gene gives fruit flies a plated exoskeleton. The turnip gene makes flies stupid, like they just fell off the turnip truck. Tudor genes leave flies without progeny. When a cleopatra gene interacts with an asp gene, it can kill the fly. A cheap date gene leaves flies tipsy after a sip of alcohol. Ken and barby mutants have no genitalia. Male coitus interruptus gene mutants spend just ten minutes on sex when the norm is twenty. Stuck mutant genes cannot physically disengage after sex. Female dissatisfaction mutants have no sex at all.

There are some fun names occasionally elsewhere also. A scaramanga gene, named after the James Bond villain, gives mammals extra nipples. The vlad tepes genes removes blood from fish. The pokemon gene almost provoked a lawsuit. The flour beetle's medea gene kills a female's progeny.

If you ever think you had a bad day, just remember the story of Tsutoma Yamaguchi in August 1945. He survived two atomic explosions on that day. The whole story is pretty amazing, but I will never complain about my day again. He lived until the year 2010. The author points to the small hope in the fact that thousands of children of A-bomb survivors remained alive as he wrote the book.

Zipf's Law states something like the biggest or most common item in each class was twice as big or common as the second item, which is twice as big as the third item, and so on. This seemed to apply with words that Mr. Zipf studied in great books. DNA may have Zipfian properties as well.

Noam Chomsky stated "Colorless green ideas sleep furiously" to show that meaningless sentences are independent of syntax. So the sentence itself is actually not quite devoid of meaning. Like modern poetry.

Computer software concluded that Shakespeare indeed did write *The Two Noble Kinsmen.* But that he did not write *Pericles.* Do we believe it?

Without the kickstart of mitochondria, primitive life might never have developed into higher life, much less intelligent human beings. The first organic molecules appeared near volcanic vents on the ocean floor. Organics were also imported from space. Life starting up was surprisingly easy. It was mitochondria that solved the problem of energy consumption. They allowed cells to expand their DNA repertoire 200,000 times.

Polar bear livers have astronomical amounts of vitamin A. That vitamin allows seals to survive in the cold.

Polar bears need it to pack on blubber. Poisons accumulate as you move up the food chain. Polar bears needed to deal with it or starve. Evolution saved them. Some explorers learned the hard way not to eat the livers of polar creatures.

Chimpanzees have short spines on their penises. In other words, they have . . . well . . . ahem . . . prickly pricks. Humans lost them many years ago, thus prolonging copulation because male sensations decreased, to say nothing of battered vaginas.

The human line almost went extinct multiple times.

A biologist named Ivanov in Stalinist Russia tried to unite human and chimpanzee genes. He failed when he jammed human sperm into chimp vaginas and not their uteruses.

Artificial insemination was considered shameful by the church. A barren couple having sex would have someone listening in at the door and then charge in at the last moment with a batch of sperm to shove into the woman in an effort to trick her egg cells into believing it came from intercourse.

Trofim Lysenko almost killed Soviet agriculture by only believing in environment factors and never in heredity.

After Einstein died, Thomas Harvey pilfered his brain for further study. It actually weighed less than normal. Americans in WWII took parts of Mussolini's bran to study a dictator.

Folding in a brain does usually indicate higher functioning. Lack of brain folds is devastating.

The sneeze reflex can be inherited and often uncontrollable. I know a bit about that since I cannot sneeze once. It usually takes me about ten or so before I stop.

The great violinist Niccolo Paganini refused communion and confession on his deathbed fearing it would hasten his demise. The Church refused him proper burial. It took a few months to finally get him into a private garden where he rested for 36 years before the Church forgave him and permitted burial.

Toulouse-Lautrec had a genetic disorder that left him with rotting teeth, a swelling nose, and lips that flopped open and drooled. Thus he wore a stylish beard. He encouraged rumors to help his reputation with you know who. He had the nickname "Tripod" for you know what. But he was a bit of a "dwarf." So he hung out in bars and bordellos. And he gave the characters there a little bit of dignity.

The temptations of the Moulin Rouge--casual sex, late nights, and "strangling the parakeet," his euphemism for drinking himself stupid--took their toll on Toulouse-Lautrec's body. He used to keep liquor in a hollowed-out cane. It all eventually killed him.

Charles Darwin was a wheezing wreck who disgusted even himself. He suffered from boils, fainting fits, heart flutters, numb fingers, insomnia, migraines, eczema, dizziness. He passed horrendous gas. Worst of all, he barfed all the time. He couldn't stop until he was dry heaving. He feared visiting the homes of others for fear of fouling up their privies. He even built his own hidden one.

Darwin's favorite child died at age ten, thus ending any remnants of a religious faith. The great thing about Darwin is all that he accomplished under these conditions. A truly great man.

The great Edward O. Wilson suggested there may be genetic roots to some social differences. He was blasted for it. Activists charged him onstage where he was in a wheelchair and threw ice water on him and shouting about genocide. Idiots.

Some people thought of cloning Jesus himself by lifting DNA from the Shroud of Turin. Ridiculous, I know. But it brought out this great comment, "You are trying to bring back the one person who is supposed to come back anyway."

There is a fucM gene in mice that can be changed to cause lesbians. I have never been able to figure out the Darwinian conundrum about homosexuality: It does not promote the species. No answers yet. Same with racial issues. Unfortunately, both are difficult to touch.

Croesus once went to hear the oracle at Delphi: "You will destroy a great empire." Of course, it turned out to be his own. Our DNA is like an oracle. Do we want to listen?

David says

This is a very good, and entertaining survey of the history of genetics. I learned a great deal about DNA, how it works, and how scientists are trying to unravel its secrets.

Every chapter contains some fascinating facts, histories, and insights. For example, Kean makes analogies between music, linguistics, and the structure of DNA. The frequency of various notes in classical music follows a power law. The frequency of words in literature also follows a power law. *Note: Kean does not mention the term "power law", but he describes it in other words.* He shows that at some level, DNA codes also follow a power law. He shows how palindromes do arise in DNA occasionally, and how they have affected X and Y chromosomes.

Kean explains how various genetics researchers made discoveries, and influenced--or failed to influence--each other. Kean has a remarkable ability for bringing human interest stories to life. For example, he tells the story of Barbara McClintock, whose incredible observational skills with a microscope enabled her to discover "jumping genes" in 1951. Scientists dismissed her discovery, because she dared to question the *stationary-gene dogma*. Her reputation suffered badly. Decades later, as genetics progressed, she was vindicated and was awarded the Nobel Prize in 1983.

I have two misgiving about this book. First, Kean frequently uses the word "theory" in the popular sense, rather than in the scientific sense. He should really have used the word "hypothesis", which is much more appropriate for a new idea that is still unproven. Second, Kean's writing is peppered with silly attempts at humor. He uses expressions like "a bitter butter battle broke out", "Heck", and "... we also needed us some brains." Such attempts at humor somehow seemed out of place, and put me off.

Nevertheless, I recommend this book to anybody who would like to get a fascinating overview of genetics and its history.

Carlos says

Wow, just wow . I'm glad that I found this book , the information in it is very important for the audience to know , after reading this book you'll understand how your genes are responsible for propensity to addiction, illnesses, deformation and even to genius. Highly recommend it to anyone interested into learning the language in which human life is based .

Jessica says

The Violinist's Thumb tells the story of the genetic code through the stories of the scientists who made discoveries about the genetic code, people affected by genetic mutations, and others. And the book is fascinating. I don't really have any science background to speak of, but I was pretty well able to follow the descriptions of the scientific information.

How I found this book was through the author's blog on Slate found here, where he shared some of the stories from the book in a shortened format. So if you are wondering if you would like the book, you may want to check that out.

Tracey says

As usual, the actual contents of this Netgalley book came as a bit of a surprise – really? I requested a book about DNA? How unusual. And it is, very; I like a book which will feed me good solid science which has been cut into easily digested pieces rather than either handed to me whole or reduced to baby food, but I haven't read one in some time.

The fact that I was thinking of polar bear livers while typing that last sentence is an indication of how well this book has done its job.

Do I now understand all there is to know about DNA and genetics?
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Oh, sorry. I was laughing too hard to type there for a minute. Because – No: I'm still an idiot in the world of science. I am now able to parrot the fact of, say, A-T and C-G pairings, and I have a tenuous grasp on what it means, but for me the general feeling is much like I remember from high school science, when I learned that color wasn't what I thought it was and that water is part of everything, even the most solid and desiccated of objects, on a cellular level. Information like that fights with my worldview. I understand the words on a theoretical level, like phasers and tribbles. It's the practical science that escapes me.

Which in no way is to detract from Mr. Kean's book. It's excellent. It's a joy. The fault, dear reader, lies not in my book but in myself, I'm sorry to say.

But I do know a whole heck of a lot more than I did when I started, and – more importantly – I understand a whole heck of a lot more than I did when I started. As for what I still don't understand … well, Mr. Kean did not leave me *feeling* like the idiot I am, despite the fact that he explained as clearly and simply – and, often,

humorously – as any human being could. And every page was painted with the wonder Mr. Kean obviously still finds in science. If all teachers managed to demonstrate this sense of wonder into their lessons, the world would be a smarter place.

And in between and around the bits that refuse to compute, there was a tremendous amount of information I could happily wallow in. I had no idea of the gravity of the reasons behind keeping pregnant women away from kitty litter – and really, it is serious, don't go anywhere near it. It never occurred to me that there could be people who survived the bombings of Hiroshima and Nagasaki both, and no real concept of what that did to them. I never knew the quirky biographies of Darwin and Mendel, Thomas Hunt Morgan, Watson and Crick, or any of the other madmen that fills these pages. And of course the title condition, that which made Niccolò Paganini what he was, which allowed him speed and flexibility that led his listeners to believe he had traded in his soul for them – a beautiful piece of forensic diagnosis, and such fun to read. The humor never gets in the way of the learning, but – as with all the best teachers – facilitates it. It's wonderful.

Literally.

Brian Clegg says

I was a great fan of Sam Kean’s The Disappearing Spoon, so it was excellent to see a followup in The Violinist’s Thumb. The violinist in question was Paganini who had a genetic disorder that enabled him to bend his thumb back far beyond the usual limit. And this is an indirect hint about the subject of the book – DNA and our genetic code.

This is, without doubt, a very good book. A quote from New Scientist on the front compares Sam Kean’s writing to that of Bill Bryson – I think this delusional, and possibly a little unfair on Kean. I’d say he is, as a pure writer, better than Bryson, but lacks Bryson’s superb comic touch. Kean attempts humour, but it certainly isn’t up to Bryson – the comparison just doesn’t make sense. The good news is that once again Kean has brought an aspect of science alive with a ton of excellent anecdotes about the individuals involved, in this case in everything from studying the fruit flies that form the fingerprint on the cover of the book to cracking our genetic code in the Human Genome Project.

Along the with, if, like me, you aren’t a biologist you will certainly learn plenty. It might seem trivial but the best thing I went away with was the realisation that in DNA’s base pairs it’s easy to remember that A goes with T and C with G, because the curved letters go together and the straight ones similarly. However, I simply didn’t enjoy it as much as Disappearing Spoon. That book was a page turner that I couldn’t wait to get back to – this was a bit of plough through experience.

This is mostly not Kean’s fault (except for the fact the book is too long, but that might have been imposed on him). It’s the subject. It simply doesn’t have the variety that arose from looking at different elements – here you are on the same single subject throughout. And sometimes, because of this, the entertaining side stories weren’t helpful because I lost track of the theme they interrupted. I also found that because it is a single topic, I really wanted a lot more depth, but Kean continues to skip on, focussing on storytelling not content, telling us things without really explaining them. On a technical issue I would also say that Kean leaves epigenetics too late and should have integrated it more into the rest – as it stands its importance really doesn’t come across.

Overall it’s an excellent book – highly readable and with lots of great stories. It’s just that Kean’s style isn’t

quite as suited to this topic as it was to the elements, and so this title is rather overshadowed by its predecessor.

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Betsy says

I enjoyed this book, and I learned a number of things, but I also felt a little disappointed by it. It was a fairly easy read, not requiring much science knowledge, and it was well written, with humor and a relaxed story-telling vibe. But I felt that it lacked a cohesive purpose. The author told a lot of stories about what genes can do and have done, and they were all interesting and enjoyable to read. But at the end of the book, I still felt that I didn't understand a lot about how genes work and how they fit into our biology.

Tony says

THE VIOLINIST'S THUMB and other lost tales of love, war, and genius, as written by our genetic code. (2012). Sam Kean. *****.
Aside from the title, this is an excellent survey of what is known about DNA and the genetic code to date, using clear expository writing along with vignettes about the people involved known only to 'insiders.' The author's previous book, "The Disappearing Spoon," showed that he knew how to write and to hold the reader's interest. He also seemed to have the uncanny ability to make difficult subjects relatively easy to understand. A lot of the science discussed in this book was discovered after I was out of school, so much of it was new to me, even though I had worked in the field of ag biotech for a while. Still, even if I had known the science, I would not necessarily have known about the various personalities involved in the discoveries. There were fascinating scientists involved. After a few basics on genetics, the author jumps right in and outlines the progress made in the field from Darwin and Mendel and on up to our time. We learn about Friedrich Miescher's discovery of DNA and about Thomas Hunt Morgan's work at Columbia that led to the discovery of gene crossover. Along the way, we pick up on Knot Theory and Zipf's Law and meet a research scientist, a nun, Sister Stimson, who made significant contributions to the science, and in her spare time helped in the development of Preparation H. The number of anecdotes goes on forever. I even learned that when cartoon characters swear in the comics – you know, @#$%^&*&^#$# - it's called grawlix. Some background in the biological sciences would be of help, but it's not essential. The book would be a delight without it. Highly recommended.

Susanna - Censored by GoodReads says

Fun. Covers everything from the attempt to breed humanzees and why humans have 46 rather than 48 chromosomes, to why you should decline any invitation to eat polar bear liver.

Holly says

This got off to a bad start for me, when on page 33 Kean equated Darwinian natural selection and "survival of the fittest." (Herbert Spencer and/or "social Darwinism" were never mentioned.) Then, in an incendiary chapter on cats and toxoplasmosis ("toxo") he never explains that a cat who has lived indoors all its life cannot carry/transmit the disease. Then .... what else? The tone was too cutesy and much of the material was too simplistic - glossing over opposing viewpoints, or assuming the reader's ignorance, or silly sentences like "I don't want to get all eugenicky on you ...." And he often went to pains not to use common terms such as "punctuated equilibrium," or corpus callosum, or haplotype - as if these would scare off the reader. At least once Kean committed the unforgiveable sin of calling chimpanzees and gorillas "monkeys."

The other problem with this book was that there were no endnotes, per sé. Several times I wanted to know where Kean was getting his information - and whom/what he was paraphrasing - but had nowhere to go. There is a Selected Bibliography - the list of books and papers Kean claims to have "consulted while writing *The Violinist's Thumb*" - but it is sketchy, extremely short, and fairly non-scholarly. There is also a post-text section titled "Notes and Errata" - but it gave no citations whatsoever. (Not to mention the word "Errata" - why is it called that when there is no list of mistakes or corrections?)

But, by the final chapter I'd come to like the book more, if only because I admired how much trivia and how many interesting anecdotes were crammed into 358 pages.

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aPriL does feral sometimes says

'The Violinist's Thumb' is a perfect read for girding up one's loins for holiday dinners where lots of family members plan to attend. Not only are the stories the author relates of the foibles and craziness of world-famous scientists who were involved in historic and present studies that have impacted knowledge about DNA give one preparation for facing down your more ordinary intolerable relatives, the chapters which actually explain DNA may provide insight on *why* you can't stand some blood relations. Body smell which repels you might be due to MHC chemistry. Those siblings you have called 'Neanderthal' since you were teens might actually be one.

Sam Kean provides ample evidence humans, and also scientists, are genetically amazing in how we duplicate, develop and express our DNA and connected processes. Perhaps our faith in civilization may be misplaced, since it is obvious, particularly from the way some of these scientists behave, that whether we are smart or stupid, civilization, affection and manners are abstract concepts (the famous 'scientific method' might be more personally offensive in action than is usually acknowledged - it looks to me like The Method is behind many of the murderous feuds and competition). But as these amazing discoveries about DNA are being revealed, some only in the last 20 years, it is clear how our biology works at the molecular level is fantastic. And hallelujah, we ordinary mortals now can see and read what these genuises are sussing out through pure intelligence, luck and cussedness. Seeing how the sausage is made, so-to-speak, might deflate our awe to a degree, but knowing these people put pants on one leg at a time (if they remembered to dress) helped me persevere trying to understand the microscopic functions they were able to measure, quantify and prove. It was never more true, as Kean shows, scientists are using logical provable observations and creative insights, building on the work of others, often in the face of withering contempt from their peers. If these tough guys can publish their guesses, explorations and conclusions in the face of public scorn, and sometimes public humiliation (twitter storms are minor breezes compared to hatreds between scientists), then

I strangely feel more bold in trying to understand their science.

I recommend this book as an amusing and illuminating general science read. If you must, skip the few chapters which are a little tough to get through (I watched youtube videos to help me) that describe very detailed, multi-step processes. The personal stories of the scientists, which occasionally led to their discoveries, or led, eventually, to the acceptance of their discoveries, are sometimes pathetic, sometimes terrible, sometimes hilarious.

Max says

In Kean's follow up to *The Disappearing Spoon* he keeps the same breezy form but switches his subject from chemistry to genetics. While we get more science history and anecdotal stories than pure science, we still learn much about how our genome works. Kean writes for the general reader. Using his tongue in cheek style, he delivers short vignettes of scientists and famous people with genetic peculiarities.

The book begins with Darwin and Mendel and follows their ideas up through double helix discoverers Watson and Crick. I had read about these men's accomplishments but little of what had happened in between. So I found particularly interesting descriptions of the scientists whose incremental advances set the stage for the discovery of DNA's structure and function.

Much of the book is tangential. For example we learn how DNA protects polar bears from overdosing on vitamin A from their diet of vitamin A rich seal meat. The vitamin A is stored in their liver. Kean gives us an account of arctic explorers who nearly died eating it. Even further afield he highlights the protozoan parasite Toxo which makes cysts in people's brains. It can influence their emotions and even induce a love of cats. He tells us about an infected couple who took in hundreds of cats.

Kean also digs into the seedier side of genetics. He brings up Ilya Ianovich Ivanov who convinced the Bolshevik regime in Russia that he could create humanzees. Perhaps Stalin envisioned slave humanzee armies. Fortunately his grisly experiments failed. We learn how DNA allows creatures like ligers and zonkeys but not humanzees. However most of us carry some Neanderthal DNA.

There is much less diversity in the human genome than in most other species. Kean attributes this to population bottlenecks many thousands of years ago when our numbers were greatly reduced and our survival as a species was tenuous. Small populations lead understandably to more inbreeding and genetic similarity but also to faster evolution. It is much easier for a new trait to sweep through a small population.

Genetics is a factor in many special abilities and talents. Regarding intelligence not much seems certain. There are too many forces at play. Kean highlights how genetic based physical oddities did contribute to two great musicians. Rachmaninoff because of his huge hands wrote music only he could play with ease. The great nineteenth century violinist Paganini had hands uniquely flexible and strong due to a genetic condition that affected the way his body made collagen.

Kean describes the competition of the 1990's to sequence the human genome. The amazing speed with which this was accomplished was due to brute force methods that leave us with a lot of data we are just beginning to understand. Adding to the complexity of the genome is epigenetics, the ramping up or down of

gene expression through cellular princesses driven largely by non-coding DNA. Epigenetic factors influenced by the environment may even in some circumstances affect offspring. Lastly Kean looks at the future; DNA modification can have huge benefits but may just open Pandora’s Box.

Lydia Presley says

I'm going to be honest and tell you the entire reason I picked up The Violinist's Thumb by Sam Kean is not because I'm interested in biology or DNA or anything to do with science really - it's because the name Paganini drew me in.

I've never been the type of girl to understand science. The closest I came was a low C in Biology 14 years ago when I attended the University of Wyoming. Ever since then I've operated under the assumption that magic sparkles course through my veins, that storks bring babies to deserving parents, and that my father gave me his caterpillar eyebrows as a way to torture me in my later years of life. Sound silly? Of course it does - that's because when I see science explained it looks as strange to me as reading a difficult piece of piano sheet music might to you (I say might here because I'm operating under the assumption that you don't play Rachmaninoff on a daily basis.)

In spite of all these misgivings, the name of Paganini, the famous violinists who - folk lore states - sold his soul to the devil for his ability to play drew me in to this book. Random fact: Franz Liszt (also rumored to be demonic in places) studied Paganini's skill on the violin and translated it to the piano. He also was the first to play music memorized on the stage for a concert. I blame him for my many breakdowns.

Anyway!

So Paganini was the bait, but what hooked me about this book was just how accessible the science was. Seriously, it blew me away. In between serious chunks of letters and strands and things I know nothing about were anecdotal stories and historic lessons about names and things I had never known about. It opened up a whole new world to me and in the process, I like to think, I learned a little something more then I expected to.

Fully enjoyable, well-researched and surprisingly fun - this book gave me really strange DNA dreams and made me feel a little bit like a smart person ... for a short while.

Ellie says

DNA. It’s in all of us but did you know it tells a story? Both of the human race and its own story of discovery. The Violinist’s Thumb is not only an introduction to the science of DNA but a trip through history from Mendel to the Human Genome Project and Neanderthals to crazy cat people.

My knowledge of DNA comes from high school biology, Jurassic Park and numerous crime shows and books, so I’m by no means in a position to understand high-brow scientific tomes. Instead, Sam Kean manages to entertain and educate. The conversational tone dips into more technical territory now and then but just as you think it’s about to go over your head, it returns to an amusing anecdote. I fell I have a better

understanding of how DNA works and how it’s shaped us as humans.

I learned so many fascinating facts. That there could be a biological reason that otherwise sane people turn into crazy cat hoarders; toxoplasma gondii (a parasite caught from cats) will release dopamine into the brain when the infected individual smells cat pee. So cats make them happy. The case study here, were a couple that held the world record for most cats in one home; 689! I could go on all day about the things I picked up but I need to leave some for you to discover yourself.

What is often left out of scientific history, are the people behind the discoveries. We may know all about Mendel’s peas but not that his research was destroyed because of his politics and not his science (I’m pretty sure his fellow monks were appreciative of his pea improvement). It’s also quite common for geneticists to try and explain historical figures through their genes, what does Einstein’s brain say about his genius? And there was a wonderful section about Toulouse-Lautrec, whilst his family’s inbreeding was tragic, his disadvantages probably led to his art. Just as a genetic condition blessed and blighted the title’s inspiration, virtuoso violinist, Niccolò Paganini.

My only grumble was a couple of errors that should have been picked up by an editor. We cannot possibly be 8% not human and only 2% human; that just doesn’t add up. I know that the author meant 8% virus DNA and 2% unique to human DNA, but it wasn’t worded that way and for a scientist, maths should be important. There was another similar thing, where he stated “virtually all animals” and then excluded all mammals in the same sentence. Virtually all would imply mammals to most of us, would it not? There may have been other slip-ups but these were surrounded in paragraphs that included things I wanted to quote and realised they didn’t make sense when I looked more closely. The fact that I still think this a five star read, shows you how much I got out of it.

Rebecca says

Kean manages to cram enough information into this book to satisfy the armchair historian, biologist, or trivia aficionado, while somehow keeping it readable and entertaining.

It's a rather monumental task, combining the history of science with the latest discoveries. He's pretty good about explaining without talking down. I think he assumed most of his readers would be like me--took bio in high school and have vaguely kept up with discoveries announced in the press, but have to shamefacedly admit that while we've heard of RNA, we can't really quite remember exactly what it does. He defines terms as he goes, assuming that you don't really remember or know a lot of this but that you're intelligent enough to keep up. I think I did, for the most part. There were so paragraphs that I'd definitely need to go back and reread, possibly with a reference, to fully understand, but he generally picks you again on the other side with enough of a layman's description that even if you didn't quite follow how all the proteins come together, you can still understand the overall implications by the end. And he does it without making you feel like a dolt, which is nice. Did I understand everything fully? No. Will I retain what I did get? Probably some of it, probably not all. But I think my overall understanding of where we stand at the moment is drastically improved.

And all along, he illustrates the science with history. Stories about the scientists who made the discoveries, about famous cases from Paganini to Einstein, about weird discoveries in our own genome. (Did you know that an enormous amount of our DNA appears to have been stolen from bacteria and viruses? The placenta looks like it was reverse-engineered from the traits that retroviruses use to hide from immune systems.

Without incorporating retrovirus DNA into our own, we never could have developed live birth.) He usually develops a sense of tension by introducing a story at the beginning of a chapter and leaving it at a cliffhanger to explain the science going on behind the case. He'll touch base with the chapter's story two or three times, using it to illustrate various facets of a discovery, before finally resolving the original story by the end of the chapter. It's a remarkably effective technique of breaking up the long explanations.

Overall, it's a fascinating look about what we know about what makes our bodies work, and how we learned it.

Maxine says

Pretty much all of us know that DNA is what makes us, well, us. But few of us non-scientists really understand what that means. Through a bit of hard science, a little history, just a touch of humour, and some fascinating anecdotes, author San Kean sets out to rectify this in his marvelous book, The Violinist's Thumb.

Kean explains in simple and rather poetic terms, for example, the difference between DNA and genes. "DNA", he tells us, "is a thing - a chemical which sticks to your fingers" while genes are "like a story, with DNA as the language the story is written in". And DNA does much more than colour our eyes blue or our hair black. As Kean points out, if it weren't for DNA, we would lack the imagination to even wonder about these things never mind try to discover why they are what they are. DNA is really the story of us, the story of our place in the universe, and, if it seems a little sad to think we are really just the sum of our genetic makeup, there is a whole lot more to the story than just our biology. It is, in fact, our DNA which makes us not only human but humane.

In some wonderful anecdotes, Kean (whose own DNA has made him a born story teller) tells us about the unluckiest lucky man in the world, a Japanese man who survived the bombing of Hiroshima, only to head home to his family who lived in, you guessed it, Nagasaki. Yet, despite surviving two nuclear bombs, he went on to live a long and fruitful life. He also introduces us, thanks to DNA, to the mother of us all, the real Eve, who was a tiny woman who lived a hundred thousand years ago. And Kean also explains why, thanks to DNA, you should never eat the liver of a polar bear unless you are a seal.

The Violinist's Thumb has to be the most fun I have ever had reading a book about science. Oh, and in case you are wondering, the thumb in the title belonged to Paganini, an 18th century violinist so talented many thought he had sold his soul to the devil. Turns out it was something which seems on the surface, somewhat less poetic but certainly more surprising and decidedly human - Paganini's incredible skill was due not to Satan but to a genetic disorder which would eventually shorten his life but which allowed him to bend his fingers and thumbs in amazing ways. When Shakespeare said "fault lies not in our stars...but in ourselves", he was more right than he could have possibly imagined even given his wonderful DNA.

Brenda says

What I learned from reading Sam Kean’s The Violinist’s Thumb and Other Lost Tales of Love, War, and Genius, as Written by Our Genetic Code (Little, Brown and Company, 2012):

I should never eat polar bear liver—unless I want my skin to peel off from foot to head.

My cats' presence soothes me because the Toxoplasma gondii parasites they carry manufacture dopamine, which has a feel-good effect on the human brain.

Whales and dolphins have hair (what Kean calls "a comb-over").

A Russian scientist (Il'ya Ivanovich Ivanov) recruited women to copulate with an orangutan named Tarzan. The scientist hoped to create a "humanzee."

Doctors enjoy diagnosing fictional characters: "Ebenezer Scrooge with OCD, Sherlock Holmes with autism, and Darth Vader with borderline personality disorder" (271).

Fruit fly genes are cleverly and creatively named.

Examples include: "groucho, smurf, fear of intimacy, lost in space, smellblind, faint sausage, tribble ([after] the multiplying fuzzballs on Star Trek), and tiggywinkle (after Mrs. Tiggy-winkle, a character from Beatrix Potter). The armadillo gene, when mutated, gives fruit flies a plated exoskeleton. The turnip gene makes flies stupid. Tudor leaves males (as with Henry VIII) childless. Cleopatra can kill flies when it interacts with another gene, asp. Cheap date leaves flies exceptionally tipsy after a sip of alcohol. Fruit fly sex especially seems to inspire clever names. Ken and Barbie mutants have no genetalia. Male coitus interruptus mutants spend just ten minutes having sex (the norm is twenty), while stuck mutants cannot physically disengage after coitus. As for females, dissatistfaction mutants never have sex at all—they spend all their energy shooing suitors away by snapping their wings. And thankfully, this whimsy with names has inspired the occasional zinger in other areas of genetics. A gene that gives mammals extra nipples earned the name scaramanga, after the James Bond villain with too many. A gene that removes blood cells from circulation in fish became the tasteful vlad tepes, after Vlad the Impaler, the historical inspiration for Dracula. The backronym for the 'POK erythroid myeloid ontogenic' gene in mice—pokemon—nearly provoked a lawsuit, since the pokemon gene (now known, sigh, as zbtb7) contributes to the spread of cancer, and the lawyers for the Pokémon media empire didn't want their cute little pocket monsters confused with tumors." (50-51)

I quote extensively here to demonstrate the humor that might not be expected in a book on scientific history. When I taught at an engineering university, students frequently informed me that engineers weren't supposed to be "creative." Kean certainly refutes that belief so far as genetic engineers and researchers are concerned.

After reading a number of other popular science/psychology books this summer, I found myself appreciating Kean's organization. The content of each chapter seemed necessary—and I appreciated the coherence of his arrangement of anecdotes. I only occasionally had trouble following passages (the one on genetic algorithms, for example). Usually, I felt very focused—and never thought, "Oh, no, it's another random case study," a common enough reaction when I'm wending my way through best selling works of nonfiction. I recommend this book to my creative writing peers—both poets and fiction writers as I think they will find Kean's approach to be both informative and inspirational.

Ross Blocher says

Genes are at the heart of this book, and the author just happens to have parents named Gene and Jean (last name Kean), so this topic is in his... well, you get it. Sam Kean is one of my favorite authors, deftly explaining scientific concepts in the context of the fascinating figures who first brought them to our

attention. The stories are full of the humor and foibles of real life, and that realistic treatment brings the people and situations to life all the more convincingly. Kean has a remarkable knack for finding fun anecdotes and interesting connections that reinforce concepts throughout his books. His enthusiasm is infectuous and bleeds out in the form of humor, copious end notes, additional notes and illustrations on his website, and in the case of this book: a hidden, acrostic message encoded in the... Chapters? Paragraphs? I've already spent a couple hours trying to decode it [and am likely over-thinking it], but figured I should write this review first, or who knows how long I'll be working this out?

The Violinist's Thumb is about the history of genes and DNA: how we came to question the nature of inheritance, our first inklings of the structures involved, dalliances with fruit flies, sequencing genomes, encoding proteins, suffering mutations, puzzling over "freaks" and chimeras, swapping DNA with Neanderthals, detecting virus intrustions, all the way up to our current, improved-yet-incomplete understanding of what makes us us. As of 2012, anyhow. Having completed all four of Kean's books, I dub this the most challenging. The subject matter itself is incredibly dense, metaphorically as well as literally: six feet of DNA is crammed into every one of our cells, and the DNA from one body could travel from the sun to Pluto and almost return. Kean has to describe with words a lot of things that are hard to understand even with pictures, and there are a lot of moving parts (one again, literally) and competing, concurrent processes to consider when thinking about the complex actions of DNA, RNA, proteins, mutations, nutrients and drugs, bacteria, viruses and epigenetic factors. There are many passages I had to read multiple times just to understand well enough to procede - if you've had formal training in genetics, this will likely come much easier to you.

Characters familiar and unfamiliar are represented. We of course learn a lot about Mendel and Darwin, but also about Friedrich Miescher and his efforts in a cold castle kitchen to extract dna from salmon sperm, never knowing exactly what he had accomplished. Thomas Hunt Morgan and the scientists in his lab bred gazillions of fruit flies in work that led to multiple Nobel Prizes, but Morgan he often took credit for ideas and never paid an essential contributor (he didn't pay the fruit flies, either). Watson and Crick are here, but so is Sister Miriam Michael Stimson, a nun who made their discovery possible (we also learn of the clergical error that led to her getting the name Michael, and that she contributed to the invention of Preparation H). Lynn Margulis's brilliant insight into endosymbionts is represented, as well as her other bold, unsubstantiated ideas. Barbra McClintock's skill with a microscope and identification of "jumping genes" is told in the light of the scientific scrutiny that drove her into seclusion, but later drew her back out as a science celebrity. We jump through history and learn of northern explorers dying (and nearly dying) at the razored-hands and nutrient-rich livers of polar bears (hint: you can over-do it with Vitamin A). Royal bloodlines and figures like Akhenaten, Tutankhamun, Henri Tolouse-Lautrec, Alexei Nikolaevich and the Hapsburgs teach us lessons about deleterious alleles. Soviet biologist Ilya Ivanovich Ivanov worked hard to breed humans and chimpanzees, and it might have worked if it weren't for those meddling political ideologies. The titular violinist is Niccolo Paganini, whose genetic condition gave him extraordinarily flexible and strong hands, but also led to his miserable bodily decline (with the help of mercury poisoning).

All of these fascinating stories (and many more), combined with artful scientific explanations, do a fantastic job of fleshing out one's understanding of genes, DNA, and the science of what it takes to build a body. A highly recommended read.

Caroline says

NO SPOILERS

This is an intriguing but brainy read that requires not just an interest in biology but a good understanding of it. Readers should be prepared to harken back to biology class(es) to recall that A pairs with T, and C pairs with G on the DNA strand--and that's one of the easier parts of this book. Nevertheless, the book contains enough concrete, easier-to-grasp ideas and information to keep the content from ever being dry. There's also something to be said for Sam Kean's engaging style. He has a talent for presenting the complex in an appealing way, and humorously at times too. In particular, the section about cat-hoarding is fascinating, as is the section explaining modern humans' connection to Neanderthals. Recommended!

Justin says

Science!

Kean's newest nonfiction book traces the history of DNA, from humankind's earliest attempts to understand how life develops through to the implications of working with the recently unzipped human genome. There's plenty of hard science that introduces the structure and inner workings of chromosomes, but the book is definitely written for the layperson.

Much like Mary Roach's works, The Violinist's Thumb is divided into thematic chapters that are composed of related vignettes that range from fascinating and tragic to offbeat and absurd. These vignettes tend to connect to and reference each other, due to the generally linear progression of scientific breakthroughs related to DNA. While the book doesn't qualify as narrative nonfiction, I got a clear sense of a solid beginning, plenty of harrowing adventures in the middle, and an ambiguously open ending.

The stories in each section range far and wide in their subject matter, from mystery illnesses and scientific scandals to frog sex and microscopic sculptures. In short, it delivered everything I want from science nonfiction: plenty of offbeat curiosities and humorous asides to give context to complex, genuinely interesting scientific information. Kean writes simply and offers plenty of casual (and occasional acerbic) editorials, which occasionally come off as one-liners but still keep the more data-driven sections from seeming too much like a textbook.

There is enough simplification and use of weasel words to annoy readers who are already well-versed in the subject matter, but it's absolutely perfect for someone like me: eternally interested in science, but not all that adept with the lingo or basic theory. After finishing this book, I've been casually perusing articles and videos on molecular biology, which says almost everything I need to about it. Thankfully, Kean includes a meaty reference list with plenty of suggestions for what to read next on the subject. As mentioned above, a few of the chapters may be a little hard to follow for people without a science background, but this is a must-read for anybody who has even a passing interest in what DNA is, how it works, and how our understanding of it has evolved and affected almost everything we do. There is more than enough compelling human drama in these pages to offset the strings of As, Cs, Gs, and Ts.
