

A Lecture on Strange Brains and Genius

Clifford Pickover

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American author and columnist Clifford Pickover speaks about his new book, *Strange Brains and Genius: The Secret Lives of Eccentric Scientists and Madmen* (1999). Since 1990, Pickover has written over 40 books about science and technology, and he is particularly interested in the eccentricities of intelligent people. He explains that this fascination developed following the Unabomber attacks, when, Pickover claims, he was investigated as a possible perpetrator due to his own interests in science. This led Pickover to consider the relationship between high intelligence and unusual behaviors. He references the lives and work of Nikola Tesla, Oliver Heaviside, Francis Galton, and Henry Cavendish, among others, commenting on their similarly brilliant and eccentric natures. Pickover speculates on how the world may have been different if the various ailments that afflicted these individuals had been successfully identified and treated. The lecture is followed with questions from the audience.

<https://www.youtube.com/watch?v=NTn9Cpg8bso>

Introduction

Susan Engel: Hello, good evening, and welcome to our Human Minds series.

My name is Susan Engel, and I direct the Adult Division in the Charles Simon Center for Adult Life and Learning and I'm so glad to see so many of you with us for this very special program.

Tonight's topic, as you know, is our guest's most recent book entitled, *strange brains and genius, the secret lives of eccentric scientists and madmen*.

I'm sure this is something we've always wondered about, but we're afraid to ask.

Our guest this evening is one of the most prolific writers there is.

He is himself unusual in the range of topics he has explored.

from black holes, to time travel, to computer art, to the possibility of alien life.

He received his PhD from Yale University's Department of Molecular Biophysics and Biochemistry.

He is also the holder of over a dozen patents dealing with the computer interfaces, and is also a puzzle columnist for *Discover Magazine*, as well as some other magazines.

He is currently a research staff member at the IBM Watson Research Center in Yorktown Heights and his primary interest, which he'll share with us tonight, is in finding new ways to expand creativity by melding art, science, mathematics, and other seemingly disparate areas of human endeavor.

A man so fascinating, he could certainly someday be the subject of one of his own books.

Please join me in giving a very warm welcome to Clifford Pickover.

Lecture Begins

Clifford Pickover: Good evening.

Today I'm going to talk about, as Susan just said, one of my latest books, *Strange Brains and Genius* and it's really going to be a roller coaster ride through the lives of brilliant but bizarre and eccentric geniuses and you'll see most of these people, even though you may not have heard of them, actually have changed our lives in significant ways.

I'm also going to unveil some of their deep, hidden secrets, their phobias, their obsessions and as I talk, you'll begin to see that there are some common threads that seem to be uniting all these strange brains.

You can see I'm getting a lot of exercise back and forth tonight.

This presentation, this book, is part of my broad interest in creativity.

Often my books have dealt with how the computer can be used as a vehicle for self-expression, and I'm very interested in the fine line between art and science and many of my books have computer graphics and color graphics that I create that are meant to stretch the mind in interesting ways.

These are some of my recent books.

They covered lots of different topics, as Susan mentioned.

One's on the science of time travel.

That was published by Oxford University Press.

I wrote a science fiction novel last year with Piers Anthony called *Spider Legs*.

The book *Science of Aliens* is on what life might be like, what the appearance of life might be like on other worlds based on what we know on creatures on Earth.

I've been very interested in fractals.

These are intricate geometric objects that can be very beautiful when displayed on a computer and if you'd like, you can visit, I have a web page that has over 200,000 visits.

Would you just type my last name, Pickover, into the Yahoo search engine, and you can download all sorts of artwork and puzzles, and it's good for all ages.

So I'm going to start by presenting the profiles of a number of unusual geniuses.

Most of these people had obsessive-compulsive disorder.

That's a disorder that compels the individual to carry out repetitive tasks and it's really something beyond their control.

They have many meaningless rituals, such as repetitive hand washing and we'll get a little bit more into obsessive-compulsive disorder as I speak.

In the book, I have a whole section on curiosities that we won't have time to speak, because I'm told I'll stop at 9 and I'll give you time for questions.

But in the curiosity section of the book, I talk about such things as the *Brain Shelter*, which is a place that has the biggest collection of brains on Earth.

I talk about Einstein's brain.

It actually exists, and people have wondered where it is.

I also get into odd topics, like do we really use only 10% of our brain, or is that just a myth? So the book covers a lot of topics, and I'm going to try to condense it to get the kernels of some of these crazy geniuses for you tonight.

I'll conclude in this section, A Touch of Madness, my thoughts on brain disorders and the role they play in art, religious experience, and even the alien abduction phenomenon and on a personal note, my interest in this started at about the height of the Unabomber scare.

I was thought to be a potential candidate for bombing, and my employer was x-raying my mail just because I wrote so much on science and technology and at that time, I began to wonder, how can someone as brilliant as Ted Kaczynski, he was actually a very brilliant mathematician, also have this dark, strange side that was obsessional and delusional and at about that time, I started researching some of these other scientists' lives and saw some interesting trends.

Weird scientists

Those are two words that conjure up strange visions of these researchers that are marching to a drumbeat that none of us hear.

In repressive times, these poor people were persecuted.

But in more enlightened times, more forgiving times, these people had the opportunity to make great contributions and you'll see a lot of that tonight.

as I talk, think to yourselves whether these people are really different beings from us.

What do they have in common? How might we foster their emergence? Because you'll see they've done wonderful things.

As I said, many of them had strange obsessions and this obsessive-compulsive disorder affects a few million people in America.

If it starts in childhood about, most of it starts in boys if it starts in childhood, and half of it does.

I believe this disorder is primarily a biochemical disorder, and drugs like Prozac and anafranil can help this.

Animals even exhibit obsessive-compulsive disorder, and if you give them the same drugs, you can stop, in many cases, their obsessions.

For example, if you had dogs that repetitively licked their wounds over and over again, you can give them some of these medications, and they'll stop and give the wounds a chance to heal.

Or you'll also see that obsessive compulsive disorder has lots of other things associated with it, often facial tics, for example and my take on all this is that it has to do with brain imbalance in the chemistry and you'll hear some more about that.

So as I considered the lives of these brilliant people, in addition to their obvious greatness, you'll see a lot of strange deficiencies.

Now I want you to picture yourself in a futuristic museum of brains, where there are the brains of all these famous people.

Perhaps time travelers have gone back in time and stolen their brains at death and on your left, here's the brain.

On the left are all these brilliant writers, artists, and composers.

These people all had bipolar disorder.

from Mark Twain to Ernest Hemingway, Edgar Allan Poe.

Bipolar disorder, which you might know as manic depression, has very high highs, where the person is really good and creative, and very low lows, which are devastating and it's definitely been shown that at least in the arts, writing, composing, painting, there's been a very high percentage of bipolar disorder.

Those are the guys on the left.

Tonight we're going to talk more about the guys on this right, which are the scientists, the philosophers.

That's my main interest tonight and we'll be talking about people like Oliver Heaviside, who was a brilliant mathematical physicist who painted his nails cherry pink.

We'll talk about Henry Cavendish, who many people rank on par with, Isaac Newton.

He was a genius in chemistry and many other subjects and he was so shy that he couldn't bear to be around people and ordered his female servants to be out of sight or be fired.

We'll also talk about Francis Galton, who was a brilliant person in pioneering studies of human intelligence and he thought everything could be counted and quantified.

He once went to a pharmacy and vowed to start at the letter A and sample every drug and he got as far as C, castor oil, and that put an end to his experiment.

We'll start with my favorite strange brains, Nikola Tesla.

Nikola Tesla was a great inventor.

He's responsible for our AC electricity.

That's the electricity that comes out of our electric outlets.

He had many, many patents dealing with motors and generators.

There's no doubt he was a genius in terms of invention.

He, like many people in this book, were never married, was celibate, and he had a number of strange behaviors, which I'll go into.

For example, towards the end of his life, his only friends were pigeons, and he spent an inordinate amount of time with pigeons.

He had a fear of dirt.

He loved to work in the dark.

He had a strong fear of germs.

He was very afraid of rounded objects, especially women's pearl earrings.

He really had a phobia for that.

He had an obsession with the number 3, which I'll tell you about, and he was prone to hallucinations at the time.

This is the Nikola Tesla Museum in Belgrade.

You can go visit today and learn more about him.

He finished out his life living in New York City hotels.

He would live for a few months in one and go to another.

He'd just live in these hotels.

He was not too religious.

He dressed very formally.

Like many people in this book, he did have rivals, and his biggest rival was Thomas Edison, for reasons which will become clear.

Occasionally I'm going to give you quotes from people about the people I'm talking about.

So you know it's not just me who's saying these people were influential and bizarre.

These people are generally influential and bizarre.

So the vice president of the American Institute of Electrical Engineers says, were we to eliminate from our world the results of Mr.

Tesla's work, the wheels of industry would cease to turn.

Our electric cars and trains would stop, our towns would be dark, our mills would be dead.

So far reaching is his work that it has become the warp and woof of industry.

A science publisher said, Nikola Tesla is the world's greatest inventor, not only at present, but in all of history.

The picture up there is a statue dedicating, in honor of him at Niagara Falls, where he helped to build these turbines that converted the energy of the falls to electricity.

Here's some favorite quotes by Tesla.

I do not think there is any thrill that can go through the human heart like that felt by the inventor as he sees some creation of the brain unfolding to success.

Such emotions make a man forget food, sleep, friends, love, everything.

He also said, I do not think you can name many great inventions that have been made by married men.

These straight dope sections will give you just the facts, then I'll get into his strange brains, his strange behaviors.

The house, by the way, on the upper right, next to the church, that's where he lived.

His father was a vicar at the church.

He worked for the phone company in 1881 and that's at the time he got one of his brilliant ideas, and it was for an electric motor that used rotating magnetic fields and what he said is, the idea for the motor came like a lightning flash.

In an instant, I saw it all and drew with a stick on the sand the diagrams that were illustrated in my fundamental patents of May 1888.

He worked in Paris for the Continental Edison Company.

He traveled to the United States to promote his ideas and alternating current.

He worked for Edison for a while and at the time, Edison was having difficulty with some of his dynamos.

So he said, Tesla, if you can improve the efficiencies of these dynamos, there's \$50,000 in it for you.

So Tesla slaved away night after night, and he actually did come up with a way of improving the dynamo's efficiency.

But unfortunately, Edison said, You don't understand American humor and he didn't give him a dime for that.

In 1888, he applied for many, many patents.

Wealthy industrialist George Westinghouse bought all the patents for \$60,000.

He became an American citizen.

That was a very happy day in his life.

He became somewhat of a celebrity because he continually gave demos in his laboratories where great lightning sparks would shoot out.

He was a celebrity scientist at the time.

He was very interested in wireless communication.

He thought it was possible to pump tremendous amounts of electrical energy into the ground or into the air, and that would be the basis for powering devices that you wouldn't have to plug into an outlet.

He believed there was life on Mars.

He started thinking about how you might communicate with them.

He put on massive demonstrations of his lightning shows.

He built a big tower in Shoreham, Long Island to investigate more of his ideas of worldwide communication, but unfortunately costs escalated and it was eventually destroyed and the last days of his life were spent in New York hotels with pigeons.

Okay, picture Tesla dining in one of these New York hotels.

His obsession with the number three was manifest in many ways.

He had to stack 18 napkins because it was divisible by three before he would eat.

He'd eat 18 clean towels.

I mean, he did his own cleaning in the hotel room.

He had to walk around the block three times.

He'd choose hotel room numbers like 207 because they were divisible by three.

He washed his hands all the time.

He had to count his food.

As I said, he was very frightened of women's pearl earrings.

It really made him sick.

He had unusual sensory crossovers.

He would drop pieces of paper in a dish of liquid, and he'd have a taste in his mouth just by doing that.

He couldn't touch people's hair except at the point of a revolver and like many people in this book, his diet was pretty monotonous.

He existed for a long time by just squab, warm milk and crackers from his numbered cans of Nabisco crackers.

He was interested in inventing from an early life.

He started when he jumped off his roof of his house with an umbrella, and he thought that would keep him safe.

It didn't.

He would glue June bugs to these windmills, and the windmills would be powered by the flapping of the bug's wings.

So he was kind of experimenting at a young age.

His brother died when he was young, and that affected him.

He started pursuing his schooling with an iron discipline and he would actually memorize log tables and mathematics and impress the teachers with unbelievable calculations he could do in his head.

He stumbled upon a volume of Voltaire, and he resolved, I'm going to read all of Voltaire.

He didn't know that there were 100 volumes in small print.

But once he resolved to do it, he was compelled to do it, and he nearly killed himself reading it all.

Again, he had some strange sensory crossovers.

He wrote, people walking on the snow left a luminous trail behind them.

In a snowball thrown against an obstacle, we have a flare of light like a loaf of sugar hit with a knife.

He could very easily visualize his experiments.

In fact, he said, when I get an idea, I start at once building it up in my imagination.

I change the construction, make improvements, and operate the device in my mind.

It is absolutely immaterial to me whether I run my turbine in my thought or test it in my shop.

I even know if it is out of balance.

To him, also, the analysis and testing was secondary.

Einstein was a little bit like that.

Einstein's fundamental insights into space came not through careful testing experiments, but just sort of an intuitive field, and the logical analysis came second.

He did have some hard times in America, where he's actually working in street gangs between his jobs.

He had a big war with Edison.

Edison, again, didn't like AC power.

He thought DC power was the way to go.

Tesla thought AC power was the way to go and Edison did everything he could to discredit AC.

In fact, he would hire neighborhood boys in New Jersey to get pets, and they would put on electrocution shows to show the dangers of AC power and on the bottom left is a drawing of the first electric chair from 1890 and it's really Thomas Edison who contributed to that, partly as a way to show the dangers of AC power.

On the right is a horse.

This is also a drawing from the 1880s, a horse being electrocuted in Edison's laboratory.

So he did everything he could to discredit Tesla and AC power, but AC eventually won for our power transmissions.

In addition to Tesla's very practical ideas with motors and generators, he had some crazy ideas too.

He thought he could light up the earth and make it a perpetual nightlight by, and give you nightlife too, nightlight by doing strange things to the atmosphere.

He also said he had these devices that he could actually literally crack the earth into, He thought he could photograph thoughts.

He made a range of predictions about the future.

He thought by 2100, their religion would be a Buddhism-Christianity blend.

He said that the Secretary of Hygiene would be more important than the Secretary of War, and Education would be, we'd be spending more in education than war and he thought we could power ships with these big power plants on the shore that would send currents of electricity empower them that way.

So he had some unusual ideas in addition to the practical ones.

As I said, towards the end, he was living with pigeons, and he almost had a romantic interest in a pigeon.

One of his biographers wrote, they perched on his head, pecked feet from his hands, and covered his arms in a living, gurgling carpet of birds, swarming over his black evening pumps and Tesla writes about a particular white pigeon that he was fond of.

She understood me and I understood her.

I loved that pigeon.

Yes, I loved her as a man loves a woman, and she loved me.

There came a light from her eyes, powerful beams of light.

At 78, Tesla claimed that he had invented a death beam that could destroy 10,000 airplanes from 250 miles away using radio waves or some kind of ultrasound.

When he couldn't pay his rent, he gave one of the hotel managers a chest in a paper bag and he said, this is a secret weapon.

You keep this instead of the rent money and the hotel manager didn't know what to do with it.

He kept it in the basement.

Finally, when Tesla died, agents went, federal agents went to the hotel and they carefully unwrapped the bag and opened up the chest and they just found a common electrical device inside of it.

That golden urn, that golden bowl, the sphere over there, that is where Tesla's ashes now reside.

They were at once in the New York cemetery and now they've been transferred to Belgrade.

Another perfect example of obsessions and genius is Oliver Heaviside, who I call the worm man from Devonshire.

He was a final contender for the Nobel Prize.

He's in person responsible for our long-distance telephone calls.

He figured out how to make long-distance telephony without distortion possible and he did a lot with laying down the foundations of electric circuit design.

He also was celibate, like Tesla.

He kept a woman, a virtual slave, in his house.

He loved working in the dark.

Instead of claustrophobia, he had claustrophilia, like many of the people in this book have, where they loved working in tightly shuttered, dark, hot rooms.

He really loved the heat.

He would keep his place hot all year round.

Painted his nails red, replaced his furniture with granite rocks, And for some reason, he signed worm after his name.

He was not very religious like Tesla.

He was also interested in birds.

He said, a little bird made friends with me.

He knows what hard creatures men are.

A quote from one of his biographers, Oliver Heaviside was an eccentric among eccentrics.

By virtue of his talent and sheer force of will, he became one of the leading Victorian physicists.

The next time you make a long-distance call and the voice of the other end comes through loud and clear, reflect for a moment on the gifted yet flawed man who made it possible.

The Electrician magazine said, with respect to the complexity, the difficulty of understanding Heaviside's work, it says, the ability to follow Mr.

Oliver Heaviside in his solitary voyages on strange seas of thought is given to few.

Some of us in our puny way paddle furiously after him for a little distance.

where we are rapidly left astern, exhausted.

He grew up in sort of an abusive house.

His father was very abusive, domineering.

He also was hearing impaired as a child from scarlet fever.

He left school at 16.

In 1874, he started writing these unbelievable scientific papers, which some of the reviewers called a superior form of gibberish.

But they weren't gibberish, and they turned out to be extremely important papers.

He never worked again.

He was supported by his brother's government pension.

He lived as a hermit in a seaside college, where one of the neighbors said, The granite furniture stood about in the bare room like the furnishings of some Neolithic giant.

Through those fantastic rooms he wandered, growing dirtier and dirtier and more and more unkempt, with one exception, his nails were always a glistening cherry pink.

At the bottom you can see where he signed worm after his signature, and for some reason he numbered the letters in his name.

I'm not even sure how he got that number relationship, but he was compelled to do those things.

Heverside was much more mathematically adept than Tesla.

He was a brilliant mathematician.

But like Tesla, he had no interest in women.

His parents had no special abilities.

He fell in love with electricity and birds and definitely a genius.

It's one of the quotes I pulled.

It's fairly safe to say that no one yet born has been able to understand his work completely.

Heverside's work on how to make a decent telephone call plays a vastly greater role in our everyday life than does Einstein's work.

He also had something called hypergraphia, where he was compelled to write and write and write.

Whether or not it got published, it didn't matter.

At the end of the talk, I'll mention how some certain disorders of the brain can compel people to do this writing.

He had a monotonous diet.

He would live on milk for days.

This is a string that I see throughout these people, this monotonous diet.

Even Edison would live on milk and orange juice for a while.

Hebasai was always concerned about his health and for the last 17 years of his life, he lived with his sister-in-law's sister and practically drove her crazy.

He made her sign contracts like she would never go out without permission, wear warm underclothing and after a few years, the sister-in-law's sister was taken away by the relatives, couldn't take it.

He always was arguing with the gas company.

He'd actually open up the main gas pipe into his house and use 800,000 cubic feet.

He was never, never happy about the heat and 1925, he fell off a ladder and died.

What I'm going to do is I'm going to go through briefly some of these these obsessive people.

I don't think we'll have time to go through them at all in detail.

Then about 10 minutes before, I'll just stop and sum it up and talk about some interesting common threads.

Samuel Johnson, he's famous for writing the first big, brilliant, authoritative dictionary of the English language.

But he is classically obsessive-compulsive.

He also had hypochondria.

He ate like a ravenous lion.

At times you'd just be compelled to eat.

He had hallucinations, facial tics, elaborate rituals while going through doorways.

He tried to make a living teaching, but his facial tics and contortions would often scare away students.

He did ransack his father's bookshelf and read and read and read like many of the strange geniuses.

When he went to Oxford, he impressed their professors greatly because he would just quote from the most obscure text.

He, like others, had some physical problems.

He was nearly blind in one eye and again, we could tell he was obsessive-compulsive because he had to go through all sorts of rituals, for example, going through doorways.

He'd hop back and forth.

He could look at clocks sometimes and not tell the time.

He'd blurt out fragments of the Lord's Prayer.

Again, if you want all the gory details that my books have, all the neat history.

This is Richard Kerwin, the flyman from Galway.

He was a famous mineralogist, geologist, meteorologist.

He also has an extreme hypochondriac.

He also had trouble swallowing.

He had a physical problem.

Loved working in hot, sweltering places also.

At night, he'd have to get up a few times and have hot tea poured into his throat just to keep warm.

Very unusual interest in chemistry and did a lot for helping Great Britain and Ireland predict the weather.

Another one who had an extreme interest in books and display talent at an early age.

One of his neat things, he'd actually pay his servants money for every fly that they caught and could bring to them.

His hatred of flies were such an extreme and he would, again, work year round with fireplaces, boiling with heat.

He just couldn't get enough heat.

Always thought he had cold or sick and hypochondria has a lot of overlaps with obsessive-compulsive disorder, because hypochondriacs, when they want to keep checking with others and they're never reassured, That's a common thing with obsessive-compulsive disorder.

Jeremy Bentham, he was the father of the utilitarian school philosophy.

This is a philosophy of the greatest good for the greatest number and his strange brains, he was extremely shy.

A lot of his stuff didn't get written up except his disciples would find his tattered notes and write it up for him.

He had a lot of friends with rats.
 I spent more time with rats than people.
 He had named household items.
 He was never married.
 Brilliant from an early age.
 He was reading Greek and Latin at the age of five.
 He had a lot of physical problems, too.
 He had very weak muscles as a kid and he had strange ideas about death.
 He said that corpses should, instead of burying them, you should plant them upright along the thoroughfares.
 Imagine going down Fifth Avenue and seeing these corpses.
 He, in his will, wanted his body to be dissected in front of his friends, and it happened and you can go see him today in the University College of London.
 There he is and his head was so well dissected that they had to put a fake one up, and the mummified head is between his legs.
 Henry Cavendish.
 This guy called Mutton Man because he ate nothing but mutton.
 He was responsible for us knowing that water was hydrogen, oxygen, and he did experiments measuring the density of the earth.
 His main problem was shyness.
 He would build separate staircases at home just so he wouldn't have to catch sight of the female servants.
 He would communicate with them only with notes, and if he saw one of the women, he'd fire them on the spot.
 Francis Galton, this is the person who did a lot of studies in hereditary, the hereditary intelligence, genetics.
 He was the guy who thought everything could be counted and tested and correlated.
 He once even went to a woman when he was exploring Africa and decided to measure her body, but he couldn't bring a measuring tape and he did it with a sextant.
 Everything could be quantified.
 He even tried to prove that prayer was not effective because he showed that the pious, like the priests, didn't live particularly long lives compared to other professions.
 So everything was quantification for him.
 Geoffrey Pike, he was a very influential person.
 His thing was Pike Crete.
 He invented a form of ice, which almost got used in World War II.
 It's a form of ice and wood pulp that was so strong, torpedoes couldn't damage it.
 They actually made a prototype of this in the Canadian length.
 It didn't melt all summer.
 But he had hypergraphia, and it was bizarre in many, many ways, including his monotonous diet and The fact that he kept writing and writing and writing.

On the Unabomber

I covered the Unabomber primarily because he was a brilliant mathematician. His IQ was estimated to be 170. I got all of his mathematics papers, which most people are probably not aware of, and they're extremely complicated.

But as you know, he went off and lived in Montana as a hermit, and went on his killing spree, and had lots of obsessions and compulsions and interestingly, his brother had similar — kind of similar predilections. His brother went off and lived in a hole in the Texas forest. Let me show you a picture of that at least. So they both went out into the woods and escaped. He went into Montana and lived in the shack for 20 years. His brother lived in this hole. But his brother eventually returned to society and obviously, [Ted], he'd go off and have a killing spree and there's lots of bizarre behaviors that we can go through later if there's time.

I'm going to sum up now with my touch of madness section, which will kind of pull some of this stuff together.

What I found by going through the scientific literature and history is that many geniuses had peculiarities of one type or another.

Maybe these strange peculiarities caused them to overcompensate and be creative and other times, I might even think that the mental problem caused their creativity.

They all seem to have an uneasiness and a sense of vulnerability.

They often wanted their work to have a personal mark.

Many of them had resistance to their ideas.

For instance, Nikola Tesla was often not taken seriously when he proposed correct ideas.

Alexander Fleming, who was responsible for antibiotics.

That idea was met with apathy from his colleagues.

Niels Bohr, who wrote his doctoral dissertation on the structure of the atom, that was turned down by his committee, later won him the Nobel Prize.

Joseph Lister, who was responsible for antiseptics and surgeries.

Surgeons didn't accept that in the beginning, that cleanliness was important.

Many people had chronic ailments, too.

Many of the ones I researched and many of the ones through genius in all fields, they were short.

They had stammers.

They had some problem.

I also found that geniuses don't produce geniuses.

Poets don't produce poets.

Albert Einstein had a child who was schizophrenic.

Thomas Edison had two children.

Both were alcoholics.

One committed suicide.

James Joyce's daughter was in an asylum for schizophrenia and the list goes on and on.

So just because you're a genius doesn't mean you're going to have a genius kid and it may also have some ominous factors.

Many of the geniuses through history have been celibates.

They weren't so interested in sex, it seemed, from Leonardo, Newton, Kant, Beethoven, Galileo.

The list is very long.

Many of these people Although they showed signs of brilliance in childhood, they weren't necessarily doing all that well at school.

Newton didn't do well.

Einstein's teacher called his presence in the classroom disruptive.

Established artists and writers experienced up to 18 times the rate of suicide of the general population, 10 times the rate of depression, 10 to 20 times the rate of bipolar disorder.

Three-quarters of eminent poets, musicians, fiction writers have psychological problems that are diagnosed.

Bipolar disorder does seem to stimulate creativity.

When people are at their highs, their manic phase, they can be creative, they take risks, they have access to words that they wouldn't even have ordinarily.

They can work for long hours.

Definitely, bipolar disorder has been shown to be good for creativity.

I talk a lot in the book about temporal lobe epilepsy.

This is abnormal electrical activity in a certain region of the brain.

This can put some of these people in almost like another dimension.

One symptom is hypergraphia.

Interestingly, another symptom is hyperreligiosity.

People can become very religious.

In fact, here's a quote from a nun who had temporal lobe epilepsy.

Suddenly, everything comes together in a moment, and you're flooded with a sense of joy, and you're just about to grasp it and you crawl into an attack.

It's easy to see how in a pre-scientific age, an epileptic or any temporal lobe fringe experience like that could be thought to be God himself.

In the book, if you want to learn more, I get into a lot of controversial areas about that.

It kind of makes you question what's under our control.

It's also thought to play a role in the alien abduction experience.

There's many symptoms of temporal lobe epilepsy that overlap with alien abduction symptoms, hallucinations and lights and this and that and people have even showed you can induce abduction experiences by applying magnetic fields to the brain.

It actually feels you've been lifted by alien hands.

Here's what David Baird at Harvard Med School says about temporal lobe epilepsy.

Temporal lobe focus and superior individuals like Van Gogh, Dostoevsky, Mohammed, St.

Paul, and Moses may spark an extraordinary search for the entity we alternatively call truth or beauty and Yves LaPlante, who wrote a book on temporal lobe epilepsy, writes, In people like Tennyson, St.

Paul, and Van Gogh, temporal lobe epilepsy provides material for religion and art. They incorporate their symptoms into poems, stories, and myths.

It's associated with personality change, even when seizures are not occurring.

It amplifies the very traits that draw people to religion and art.

If Tennessee and all these other people who had temporal lobe epilepsy were alive today, we could perform various tests on them to diagnose it.

In fact, one of them is very interesting, called the clock test.

You tell these people to draw a clock, and they'll draw it extremely accurately, too accurately.

They'll draw every tick mark from the minute hands.

They even sometimes put the brand name on the clock.

But even if we could diagnose some of these people I've been talking about, it wouldn't have done them much good because the treatments back then were pretty extreme, like putting a hot iron to the head or a castration.

Today we have anti-convulsant drugs which also, in addition to helping these epileptic problems, can sometimes help bipolar disorder and many of these types of disorders I'm talking about have a lot of overlap in their symptoms and treatments, which leads me to believe there's lots of similarity.

Even shyness appears to be inborn and it's clear to me that these disorders clearly play a role in creativity.

But that shouldn't be too surprising.

It's not even meant to demean the religious experience or any of these experiences, because all of our thoughts and beliefs and disbeliefs come from this organic thing in our skull.

So the beauty as well as obsession comes out of it, and it's all worthwhile and interesting.

I believe it's caused by anomalies in brain chemistry.

Even viruses can trigger.

You can get a virus or a bacteria infection, and one day the kid could wake up with obsessive-compulsive disorder.

So I believe there's a lot of organic components to this.

In summary, let's think about if we had drugs to medicate some of these people I've been talking about, would society have lost? might have made them happier, made them live more normal lives.

But if their work were an expression of some of their obsession and their ability to focus on certain problems at the exclusion of others, or be pack rats and gather all sorts of equipment, we'd probably lose some inventions.

If Cavendish, the very shy person, he might live his life in marital bliss and not do any of his experiments.

But on the other hand, these drugs would remove some of these shackles from their lives so they wouldn't be so tortured.

So there's pluses and minuses that have to be weighed.

One of the problems for people with these disorders is that they ask lots of questions, but they don't always know the most important questions for which to seek answers.

Thank you very much.

I can take any questions that you're interested in.

Yes.

Audience Questions

Audience member no. 1: A lot of these people that you showed us were from a different Attention, that keeps safe today.

Samuel Johnson was thought to have Tourette's disease, when you're saying about stuttering and so forth and I believe that's why a lot of these people did not get married because, you know, they were repulsive to people to be around and because of their strange habits and of course, as they got older, it just got worse because it was never treated.

Given all of that, what do you think about attention deficit disorder and being treated with?

Clifford Pickover: She asked about attention deficit disorder and Ritalin.

It seems like we are medicating, obviously we're medicating more and more these days.

We wouldn't let some of this eccentricity flourish now.

We'd drug it.

So we'd lose some of these people.

We also, in compelling everyone to go to school, you lose some of the eccentricity that way.

So it's very hard to say.

There's pros and cons.

Obviously, with something like manic depression, you'd like to have a drug that keeps the high but gets rid of the lows.

So, and I'm sure in the future we'll have that sort of stuff.

A lot of people right now don't want to take the drugs for manic depression because they love the high so much that they want it.

So it's hard for me to answer where they were drugging the kids too much, but it's definitely something that should be on our minds.

Yes.

She asked about schizophrenia and children.

My feeling is from reading the literature that you'll find that even if a parent doesn't have one of these disorders, the high percentage in relatives.

I believe it's genetic and I don't think something like schizophrenia is pushed, people are pushed to the edge to have schizophrenia by a bad parent or bad upbringing.

I think it's largely biochemical and genetic.

Obviously, the environment plays a role.

But along the lines of your question, you'll see things in, if the person themselves doesn't have manic depression or some problem, some relative at a higher rate than you'd expect by chance would have it.

So you see these clusters that seem to indicate heredity plays a strange role in all of this.

Audience member no. 2: How much is this sort of behavior associated with genius? Is it almost every genius? Or is it 10%, 15%?

Clifford Pickover: Yeah, obviously, most people with obsessive-compulsive disorder are not geniuses.

Most geniuses don't have obsessive-compulsive disorder.

It's just that there seems to be a higher percentage.

I had some of the facts and figures for bipolar disorder with the eminent poets and writers and composers.

We can go back and look through the statistics.

I focused on obsessive-compulsive disorder, and I don't have statistics.

It's just informally, as I was going through the literature, the scientists, the collectors, the people who are pack rats seem to have a high percentage and it's hard to know whether obsessive, just compulsory, cause some of it, or do these people flourish in spite of it, wanting to get above it.

But it does seem like there's a higher percentage, and I don't, I did not do a statistical study to figure out exactly how much.

Right.

I'm being kind of simplistic here in my talk, but there are flavors.

When I say these people have obsessive compulsive disorders, there's overlaps with Tourette's and other syndromes, which I don't think we have time to get into now.

But I am being simplistic.

But it did seem they did have these problems of one sort or another.

Yes.

Yes.

Audience member no. 3: There just was really no science.

There was a lot of art that, you know, you look at some of the, like Jan Van Eyck, some of the Dutch masters, the miniaturists are, you know, are very, very impulsive.

I think it's problematic in their mind to basically say that all people with OCD or people with bipolar will tend to one side or the other.

I also think that anxiety disorders, and there's a lot of research being done on OCD now.

It's much more pervasive than it was thought to be, and there are many more different types of OCD, and it's being really fleshed out a lot.

I think it would be really important to look more, and you don't have time now to really go into details of it, but I think for just general audience purposes.

Clifford Pickover: Yeah, I agree with you and a lot of these things overlap.

A lot of people with bipolar might have obsessive, compulsive.

I do talk about flavors of OCD in the book, one that you probably know about called trichotillomania, which is more in women, where they're compelled to pull their hair out.

So there's all these subcategories and flavors.

I do focus on a lot of scientists from the Victorian era, partly because I think Victorians had almost an affection for these people.

They could flourish very well and a lot of these towering figures, it strides back then.

You don't hear as many towering figures today, partly because...

I'm guessing.

But for example, in physics, physics is so complicated today that you couldn't make great new discoveries in physics without having extreme mathematical underpinnings and back then, Tesla could make his motors without, you know, years and years of training.

Yes.

We're learning so much about the human body and cells in biochemistry.

I'm sure in the future we're going to be virtually, well, go beyond aging.

We'll live hundreds and hundreds of years.

We'll be able to alter our minds in beneficial ways.

Along what the mind can do in the universe, think about, you know, this brain here is not all that much different from a chimpanzee's brain.

But think of all the questions we can ask that a chimpanzee can't.

We can ask questions about prime numbers and black holes and gravitation.

A chimpanzee can't ask that question.

I wonder how many questions are there that we can ever answer or ask— sorry, we can ever ask these questions because we're limited by our brain.

I believe we are.

I believe that there's many questions we can't ask.

But what is a miracle about this is that this thing basically evolved to keep us alive and running from lions on the African savanna.

Isn't it a miracle that that produces, you know, Mozart's symphony and all the things we've done for a brain that probably didn't evolve for that purpose? But again, I always wonder what is there about the universe that we can never understand because of this limitation.

But I wouldn't be too sad about that.

My feeling is that computers will be our collaborators and prostheses in the future.

We'll be using computers to help expand our minds, to help us reason beyond the limits of our intuition and enter these new worlds.

They'll be our sort of collaborators as we go into the next century.

Yes? You asked when I was thought to be a target for the Unabomber and I started getting interested in this.

Are you asking how much I knew about the Unabomber at that point? Oh.

Oh.

He's asking whether, when we didn't know who the Unabomber was, did I speculate on who it might be? I have no more insight than anyone.

At that time, we didn't know he was a famous mathematician.

He did seem to have all sorts of redundancies, by the way, in his bombs, more initiators than needed and now, in retrospect, we've seen as mathematics, he had many more backup proofs than needed.

There's some kind of strange similarities there.

But at that time, I had no idea.

Just that it could be dangerous.

Yes? He's saying that — I've said that geniuses have this trait and this trait, but you could find just an equal number of geniuses with other traits.

The studies I cite, for instance, with bipolar depression, do seem to think that These artists, composers, and writers do have a much higher percentage than the general public.

There have been studies— You're right.

What I'm doing is pretty simplistic here at this talk.

But people have gone through geniuses as defined— we can talk about what genius is the definition.

One person defined it as how to have an entry in a biography of people, there was more than three pages, they were very influential in these, let's say, scientific biography.

People went through that and did seem to find that these geniuses had some sort of abnormality, more so than just by chance, more so that you can shove them into another category.

But you're right, this is rather simplistic, but I do think there are trends that we can look at, and we can talk about that after the talk about certain studies that I think do distinguish these people in interesting ways.

Yes.

Audience member no. 4: I just read the book *How to Think Like Leonardo da Vinci*, which is a great book.

But did you learn anything from your sense of geniuses that would allow, quote, normal people to produce work like geniuses or?

Clifford Pickover: Improve their work? Well, I did a survey at the end of this book where I asked people what do they think genius is and it's not just raw IQ.

I mean, as — I mean, you can define it in many ways, but we were thinking it's not just IQ, but it's also the drive to use it.

You have many high IQ people that don't — are not creative or don't contribute to the world.

To use — you know, I think take risk is one of the main things.

Most of these people were risk takers and they tried to persevere in spite of what other people were saying.

They had the ability to focus.

Whether reading the book will tell you how to be a genius, I don't know, but maybe you'll be inspired by some of the good sides of these people's lives and I have some strange surveys in the back where I say, What do you think will happen to society? People with 100 times our IQ were introduced and bizarre questions like that, which are kind of fun to read.

The word genius is very hard.

She asked about Bill Gates, would I consider him a genius, or what do I think of modern-day inventors? Of course, they shape the world tremendously and probably by the definitions that I go in this book about being these unusual people who persevere and change the world, Bill Gates would be a genius.

There are some people in here, in the runners-up list, these people were either not weird enough or not influential enough, but people like Richard Feynman, who was more of a modern-day person, his IQ, I believe, was not judged to be particularly outrageous, yet by all measures, he was a brilliant individual and these people, I think the world needs these type of people to help change the world.

We just have to decide what's for the good and what's for the bad.

Yes.

Most of them did not have special parents.

Most of them seemed to— this gentleman will probably argue with me— but most of them seemed to have older parents.

Most of them seemed to have a parent that died early or early in their life— kid's life.

It seemed to be that trend.

In fact, other people, not just me, have written studies where many geniuses seemed to have older parents.

We can think about what that means but as I said Geniuses don't necessarily give rise to genius kids and Although some of these people have supportive parents many of the parents are pretty ordinary.

Audience member no. 5: I've read that Contrary to Popular men's genius and madness are generally more stable most ways.

Clifford Pickover: She's asking, do some of the high IQ people have healthier lives or happier lives? There's lots of — there are lots of studies that try to correlate things.

Definitely, whether — we can just debate what this means, but generally, one of the biggest predictors of criminality is low IQ.

You know, it can mean many things, but — and I don't know if there's some cutoff beyond which the person lives a more difficult life.

Maybe there is.

That's interesting.

Audience member no. 6: Maybe — Small, fragile, nerdy, and stable building child and it's actually quite the contrary.

They're usually tall, well developed, and most of you.

Clifford Pickover: I'm sure in a certain range, you can get happier, definitely more productive, more money-making, but — yeah.

Yeah, as I mentioned, a lot of these people could flourish.

In repressive time, they wouldn't do so well, but because Victorian England had a almost affection for their eccentrics, That's probably why these — and also there's no — I didn't have any women.

There's some women in my runners-up list in the book.

But I think that's partly because in the past, women had not had the — society didn't let them be influential.

I was just doing a paper on the most influential women mathematicians, and to try to be a woman mathematician 100 years ago, it was impossible to go to universities and teach.

So there's a lot of things that can skew this result due to our culture, too.

Yeah.

Marie Curie.

Yeah.

Most geniuses are not obsessive. Most obsessive are not geniuses.

I just seem to find a high incidence and it just made me wonder about temporal lobe epilepsy and creativity and all these things.

But you're right.

Most geniuses aren't like this and most obsessive people aren't geniuses.

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A Lecture on Strange Brains and Genius
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