$50 billion is going to be spent on vegetables, which is why we need diet supplements.

Today, $200 billion a year is spent on diet-related illnesses, and 9% of children have type 2 diabetes.

$200 billion

So here's the thing: you need eight billion more, but that's not a lot.

Eight billion is two dollars and 49 cents, and that's what the government is allotting for lunch.

Most school districts spend two-thirds of that on salaries and expenses.

So less than $1 a day is spent on children's food, mostly 80-90 cents, 56 cents in Los Angeles.

Okay, that means you didn't spend a dollar on lunch.

I don't know about yours, but Starbucks, Peet's, etc., an extra-large latte is five bucks in San Francisco.

A cup of gourmet coffee costs more than a school kid's meal for a week.

you see? it's a shame

This is a shameful thing for the country.

in the richest country

In this country, the children who need food the most are fed the worst food.

Children from families who can't afford school lunches are given this kind of food.

these kids get sick

I have to think about these children

Together we can bring about reform

Each one of us, whether we have children or not, whether we care about children or not, whether we have nieces and nephews or not, we can make a difference.

If you sit down and eat with your children, if you take your children, grandchildren, nieces and nephews to the farmer's market for shopping, taste it with them.

Please take the time to show your interest

On a larger scale, we're in the midst of a 19-month presidential campaign, and the number one thing we want our future leaders to want is the health of our children.

thank you

Hello. I'm going to talk about the importance of giving praise, being grateful, and expressing these in a clear and heartfelt way.

The reason why I started to be interested in this kind of thing is that as I grew up, I realized that until a few years ago, I wanted to convey my gratitude to people, I wanted to praise people, and I myself wanted to be praised by people. But it stops it.

So I asked myself, "Why?"

I was embarrassed and confused.

So the question changed to "Is this just me?"

I decided to investigate there.

I am fortunate enough to work in a rehab facility where I have the opportunity to meet people who are facing life and death from addiction.

Sometimes it comes down to the simple things, like their biggest pain was never hearing their father say, "You're my pride."

But later they overhear from the rest of their family and friends that your father was telling everyone that he was proud of you, but he never told his son himself.

The reason is that my son didn't recognize the need to hear.

So my question is, "Why don't we ask each other about important things?"

I know a man who, during his 25 years of marriage, always wanted his wife to say to him, ``You're the reason I'm here with the kids because you're working.'' But he never asked.

I have an acquaintance who is very good at this sort of thing.

When she sees her husband once a week, she says, "I want you to thank me for the housework and taking care of the children."

So he replies, "Oh, yeah, thank you."

Praise must be absolutely sincere. But she takes responsibility for it.

Next, I have a friend, April, who I have known since kindergarten.

If you ask her, it's like, "If the kids are in charge, why don't you thank them?"

So the question is, "Why was I blocking these?"

Why can't other people say those words too?

Why can't I say "I want my steak medium rare" or "I'm looking for a pair of size 6 shoes" but not "Can you compliment me like this?"

Because this will show your weakness to others.

You will reveal where you become vulnerable.

You will confess where you need help.

That's why I treat you like an adversary in my heart.

Because what can you do with information that becomes a weakness?

You can ignore me

Or you can take advantage of your weaknesses.

Or maybe it will meet my actual requirements.

I love this story, but the other day I took my bike to a bike shop, where the clerk seemed to do something called "fixing the wheel."

He said, "Hey, fix it and it will be better."

When I picked up the bike, he fixed all the small distortions in the wheel that had bothered me for two and a half years. The bike was like new.

So I'm going to challenge you all.

I want you guys to fix the distortion too. Be honest about actions that deserve praise.

what do you want to be said? Go home and ask your wife, "What do you want me to say?"

Go home and ask your husband, "What do you want me to say?"

When you get home, help others by asking these questions.

Easy, right?

Why is this important?

I'm talking about world peace.

How can we achieve world peace between different cultures and languages?

I believe it starts with each family under one roof.

Let's start with what we can do.

So I would like to thank the audience for being a wonderful husband, a wonderful mother, a wonderful friend, a wonderful daughter and son.

Maybe no one ever told you that, but you've done really well so far.

And I would like to thank you for joining us today and for creating a change in consciousness.

thank you.

(applause)

I thought there was a podium, so I'm a little restless.

(Laughter) Chris asked me to tell you again about the discovery of the structure of DNA.

He said, let's do it.

It's kind of boring to me

(Laughter) Well, I've written a book, so I have something to say... (Laughter) How did you find it?

And at the end, if I have time left, I'd like to spend at least five minutes talking about something that interests me at the moment.

The one in the background is a picture of me when I was 17.

I was a third year student at the University of Chicago, and the reason why it was three years is that the University of Chicago let me in after only two years of secondary school.

I was grateful to be released from middle and high school because I was really tiny and I had no talent for sports.

Let me tell you a little bit about my upbringing. My father was raised in an Episcopalian-Republican family, but after a year in college, he was an atheist and a Democrat.

(Laughter) My mother was Irish Catholic, but she wasn't very religious.

That's why, by the time I was 11, I stopped going to church on Sundays and started going birdwatching with my dad.

And when I was still very young, I met Charles Darwin.

he was a big hero

Because it shows that the organisms we have today are the result of evolution.

I was majoring in zoology at the University of Chicago, and I was wondering, if I was good enough, I could get a doctorate in ornithology from Cornell University, and so on.

And then I saw a book review in a Chicago newspaper called "What Is Life?" by a wonderful physicist named Schrödinger.

that was exactly the question i wanted to know

Darwin revealed what happened after life began, but what is the essence of life?

According to Schrödinger, it's the information that's in the chromosome, and it's supposed to exist as a molecule.

I understand chromosomes, but this was about molecules, and all the information exists in some form of digital form, and the other big question is, how is that information replicated?

That was the book, and from that point on, I wanted to be a geneticist, to understand life through genes.

I had a hero far away

It wasn't the baseball player, it was Linus Pauling.

So I took Caltech (California Institute of Technology) and got rejected.

(Laughter) So I went to Indiana University, actually, I was as strong in genetics as Caltech, and on top of that, Indiana had a very strong basketball team.

It was also around this time that I began to wonder if DNA was the identity of genes.

And I thought that when I got my PhD, I should pursue DNA.

So the first thing I did was move to Copenhagen, because I thought maybe I should become a biochemist, but then I realized that biochemistry wasn't very interesting.

We weren't really moving in the direction of trying to figure out what genes are. It was all about the science of the cell nucleus.

read in about 2 hours

At that time, I attended a conference held in Italy.

There was an unexpected speaker who wasn't on the program, and he talked about DNA.

I'm Maurice Wilkins. He used to be a physicist. After the war, he wanted to study biophysics, so he chose DNA because the Rockefeller Institute had shown that DNA might be the molecule that makes up genes in chromosomes.

I thought it was protein

Wilkins thought DNA was the most likely cause, so he showed us this X-ray diffraction image.

It looks like a crystal, which means that DNA has a structure, even though it's a separate DNA molecule, each carrying a different instruction.

So the whole DNA molecule had something in common.

I wanted to do research with him, but he wasn't a former birdwatcher, so I ended up going to Cambridge, England.

I went to Cambridge because it was at the forefront of X-ray diffraction research at the time.

But back then, it was the domain of physicists.

So the best place to study X-ray diffraction was the Cavendish Laboratory in Cambridge.

And that's where I met Francis Crick.

I didn't know him before then he was 35 I was 23

And in less than a day, we came to the conclusion that there may be a shortcut to understanding the structure of DNA.

Instead of clarifying it by a rigorous method, I thought it would be good to make a model, collect coordinate information such as length based on the X-ray diffraction photograph, and make an electron density model.

We just have to figure out how the molecule folds.

What inspired me to do this was Linus Pauling, in the middle of this picture. About six months ago, he proposed the alpha-helical structure of proteins and kicked the guy on the left out. Sir Lawrence Bragg, a professor at Cavendish.

Here's a picture of him a few years later. Back then, Bragg had reason to laugh.

But when I arrived, I wasn't laughing, because I was somewhat embarrassed by Pauling getting ahead of me in the alpha-helix structure, and the people at Cambridge weren't chemists, so they failed.

Of course, Crick and I weren't chemists either, but we did our best to build a model, and Francis knew Wilkins.

He said he thought it was a helical structure.

If you look at the X-ray diffraction diagram, it looks like a helix.

We built a triple-strand model.

people from london came to see

Wilkins and his colleague, to be exact, his later colleague Rosalind Franklin, came and looked at our model and laughed.

If it was a terrible model, it was just like that.

That's why we were told to stop doing models, saying that we were incompetent.

(Laughter) So we didn't build models anymore, and Francis continued to work on proteins.

I didn't do anything, I just read the paper.

Reading papers is generally a good thing because you learn the facts.

And Linus Pauling kept telling people in London that he would definitely work on DNA.

If DNA is that important, Linus should know.

he builds a model and we're outsmarted

He was writing to people in London asking if they could show them their X-ray diffraction pictures.

Linus didn't have X-ray diffraction pictures, because they wisely declined.

The photo was actually in the literature.

Linus wasn't watching carefully.

But about 15 months after I moved to Cambridge, the son of Linus Pauling, who was in Cambridge at the time, started rumors that his father was doing DNA research.

And then one day, Peter came in, identified himself as Peter Pauling, and gave me a copy of his father's manuscript.

I was afraid I might have been beaten

I didn't do anything and nothing was recognized

(Laughter) And in that manuscript, he proposed a triple strand.

I read it and it was crap

(laughs) In that world... is this? (Laughter) There were hydrogen bonds between the phosphate groups.

If the maximum pH in the cell is about 7, then it's impossible for such hydrogen bonds to exist.

We rushed to the chemistry department and said, "Is it possible that polling is correct?" Hast said, "No," and we were delighted.

(Laughter) We hadn't lost yet, but I was terrified that somebody would point out Linus's mistake in Caltech.

Bragg said, "Make a model."

And a month after I got Pauling's manuscript, I took it to London and showed it to the people there and said,

"Linus is wrong. We still have a chance. We should build a model soon."

But Wilkins said, "No, Rosalind Franklin will be moving in a couple of months, so let's get to work on the model after she's gone."

So I went back to Cambridge and told him about it, and Bragg said, "Make a model."

Of course I want

This is Rosalind. She was a chemist in a way, but what she was really doing was -- she didn't know anything about organic chemistry or quantum chemistry.

she was a crystallographer

And maybe part of her reluctance to build models was that, like Pauling, she wasn't a chemist.

So Crick and I started modeling because the little chemistry I had in the past wasn't enough.

On February 28th, 1953, I got the answer.

It was all thanks to a rule, and it's a very good rule, if you ask me, "Don't be the best person in the room."

We certainly weren't the smartest chemists out there.

When I brought him a model of base pairing to show him, it was rejected by chemist Jerry Donoghue.

If the position of the hydrogen atom is wrong,

I put it according to the book

he said he was wrong

The next day, I thought, "Maybe he's right."

And by changing the location of the hydrogens, he found base pairs, and Francis quickly realized that the direction of the DNA strands is absolute.

I knew right away that the theory was correct.

It really all happened in about two hours.

from nothing to existence

This was obviously an important discovery, because if you put an A next to a T and a G next to a C, you have a replication system.

We now know how genetic information is passed on.

The order of the four bases was important.

So it's a kind of digital information.

And by separating the two strands, replication takes place.

And if it doesn't -- well, you have to believe, because there's no other way.

(Laughter) But the average scientist doesn't think that way.

Most scientists are really pretty boring

Because you won't think about it until you know it's right

But we thought, well, 95 percent — or 99 percent right.

So think about it, in the next five years, our nature paper was cited only five times.

So, without anyone's help, we tackled the third question: What does this genetic code do?

It's been pretty obvious that it feeds the RNA, but how is it then transferred from the RNA to the protein?

For about three years, I was just trying to figure out the structure of RNA.

It didn't work because I couldn't get a good X-ray diffractogram.

I was very unhappy because the girl I liked didn't marry me.

It was a fucking fucking time.

(Laughter) Here's a picture of Frances and me before we met her, and she still looks happy.

(Laughter) When I wasn't sure which direction to take, I did this: I started the RNA Tie Club.

The necktie was designed by George Gamov, who was also a great physicist.

He was one of the members, and we wanted to know how the four-letter code for bases turned into the 20-letter code for proteins.

Feynman, Teller and other friends of Gamow were also members of the club.

But this is the only picture. . . No, we only took pictures together twice.

Both times, someone wasn't wearing the all-important necktie.

Francis is on the top left, me on the bottom right, and next to him is Alex Rich, a former doctor and crystallographer.

This was taken in Cambridge in September of 1955.

I'm laughing, but I think it was a smirk, because the kid ran away.

(Laughter) It wasn't until 1960 that I really started to feel joy again, because that's when I discovered that there are three types of RNA.

And DNA is RNA RNA carries information for proteins

I found out that I would provide

And then Marshall Nirenberg added artificial RNA to the protein synthesis system and succeeded in making polyphenylalanine, the genetic code was deciphered for the first time, and by 1966 it was completely understood.

That's what Chris wanted me to tell you and what happened after that.

I'll go back a little

When I first discovered the structure of DNA, in my first lecture at Cold Spring Harbor, physicist Leo Szilard asked me, "Are you going to patent it?"

But he knew patent law very well, and he knew it was impossible to patent this discovery, because it wouldn't do any good.

(Laughter) That's why DNA never became a very useful molecule, and I didn't have much of a lawyer until 1973. Twenty years after its discovery, Boyer and Cohen at Stanford University came up with the recombinant DNA method in San Francisco, and Stanford patented it and made a fortune.

At least they patented something useful.

Then they developed a way to crack the code.

All of a sudden, the biotechnology industry emerged, but I still had a long way to go before I could answer the question that haunted me as a kid: born or raised.

We're running out of time, but let's go on a little further. This is Michael Wigler, an incredibly clever former mathematician and physicist who has developed a technique that allows you to sequence millions of sites in a sample of DNA.

On the left is a conventional chip, and on the right is NimbleGen's photolithography, which is a lot more advanced than Affymetrix.

We use NimbleGen's

This technique allows comparison of normal DNA with that of cancer.

As you can see in the graph above, high-grade cancers have insertions and deletions in their DNA.

So DNA is pretty messed up.

This technology will one day enable so-called "DNA biopsies," so before you go for cancer treatment, you should definitely look into it this way and understand what kind of cancer you're fighting.

It's not perfect, but it can be very helpful.

We worked on breast cancer first, because there's a lot of research funding for that, not government funding.

And I also have a little bit of interest in research for prostate cancer, which doesn't treat unless it's very dangerous.

Besides cancer cells, Wigler looked at normal cells and found something quite surprising.

It means that we all have about 10 places in our genome where genes are either missing or extra.

In other words, we're all imperfect in some sense, but the fact that we're still alive doesn't really matter if we have more or less.

But when such deletions or amplifications occur in the wrong place in the gene, they may cause disease.

The first thing he studied was autism.

I focused on autism because I had the research funding for it.

The tests cost about $3,000 per person, and parents of children with Asperger's, a form of autism, sent samples of their children to private companies, but they weren't accepted.

We were able to identify the autism gene just by scanning it, which conventional genetic analysis methods would not.

As you can see here there are quite a lot

Many children with autism develop autism because they have large defects in their DNA.

When I say big, I'm talking at the molecular level.

One autistic child was missing five million bases from one of his chromosomes.

I haven't seen my parents yet, but they probably don't have the same defect, because otherwise they wouldn't be parents.

Our autism research is just getting started, and we have $3 million in funding.

I think we need at least 10 million to 20 million dollars before we can help people who think their child might have autism or who have a child with autism to identify DNA abnormalities.

So this method of analysis should probably be applied to everything.

It's a great way to identify genes.

And finally, let me tell you about the 20 schizophrenics we studied.

I thought we'd have to see hundreds of cases before we could see the full picture, but as you can see, seven out of 20 had abnormalities, which is a significant number.

In the control group there were 3

What were the abnormalities seen in the control group?

I have a mental disorder, but didn't you realize it?

Or was it normal — maybe it was normal

I suspect that there are genes that predispose people to schizophrenia, and that only a certain fraction of people with those predisposition genes will develop schizophrenia.

I don't have hard evidence, but my hypothesis is that left-handed people are more likely to develop schizophrenia.

Thirty percent of people with schizophrenia are left-handed, and schizophrenia also has a very peculiar pattern of inheritance: 60 percent of people are genetically left-handed, but only half of them become left-handed.

Some people who think they are right-handed are genetically left-handed.

(Laughter) It's a very exciting time for me.

We should also be able to find the gene for manic depression.

There's a clear cause-and-effect relationship, and if we had enough research funding, we could find it all this year.

Thank you very much

i am a toy designer

Pantomime in front of the designer

and an entertainer

Before that, I was a silversmith. Before that... I left home when I was 15 and a half.

I didn't want to go

Now that I've studied quantum mechanics, I understand

(laughs) It's cool, isn't it?

Now, I would like to introduce you to the world of toy design through my work.

So what I'm going to show you is a video from the early days of toy design.

Make weird things in your garage

You go to a toy company, you sit around the table, and the person in charge says, "pass, pass, pass."

Toy Designer Sounds good, but... well, I'll show you the tapes I always show.

This is the name of my company, Giving Toys.

I used to work for Mattel

After I left Mattel, I started building a hamburger maker and got a license.

It's a hamburger maker It's made with peanut butter or something like that This is a French fries maker It's small but you can eat it

Made by disassembling a pasta maker

Is this a mac nugget maker

Yes, I'm a McNugget maker. My eldest daughter is making McApple pies.

As you can see, pie, cinnamon, sugar, eat, eat, eat... now it's 135 kilos.

just kidding

this is on the store

Became a $15 million series

I got some, but I didn't get any royalties.

Next comes various toys

This is an unreleased missile foam launcher

Squishy Head Less Uses

This is what I tried to make you dance with a wig

The robot's eyes have a controller on its back.

It's one month's rent

This is a walking Barbie When I say "Alright!"

The company immediately said, "Well done!"

It's a fighting robot. I thought everyone wanted it.

Fight and get up Isn't it cool?

It was commercialized, but was quickly shelved.

that's cool

I'm testing to see if I can catch it by having my pug fight it.

Well done

I used a small phone jack so I could spin.

We have the records, but the kids won't know

this is a clay maker

When I went to the play-doh clay toy maker and said, "You can make a clay animation,"

"Don't talk to us about Play-Doh"

I made a lego robot

i thought this would work

But Lego knows all about Lego

Lego not made by Lego was not allowed

and animatronics

i love dinosaurs

I've also worked in film. When I was 12 years old, Nicholas Negroponte saw this.

Why do kids love dinosaurs

This is in the 80's, working in a 3D studio.

I'm David Letterman

you know how old

another cousin

This is the "dangerous toys you don't want for Christmas" section.

For the first time in my life, I saw a chair with a saw launcher and a flamethrower.

My career peaked here

At the back of the studio, there was a humanoid figure of a colleague who was absent.

This is methyl ethyl ketone popping out of the wiper motor

I also acted like an actor

Not at all

Dr. Yatz is his name, and it's his job to take apart toys and show off his engineering.

You can see the massive amount of parallel processing on the Super Famicom.

CD-ROM for 3-D glasses on the left

Stan Reznikov was operating

I can see a small window

You can see the bubbles under the Steadicam The keyboard is on your wrist

You can see the bubbles under the Steadicam The keyboard is on your wrist

long before my job

Dr. Yatz: "Be careful! Be careful! Battery is dead."

I've been dizzy Dr. Yatsu: "I Love Toys"

This is what I meant to say "I love toys"

This is the first chapter

Only 1/20 or 1/30 hit the market.

Only 1/20 or 1/30 hit the market.

You know, there's an automatic hair wrap machine that wraps your hair and pulls your scalp.

And then I left LA and moved to Idaho, where it was quiet and peaceful.

That's why I started this project.

There is a correlation between innovation, art and science in toy making.

It's the blend of them that drives the innovation.

I tried to wrap this up in some symbol, at least in a way that made sense to me.

There's a dynamic balance between art and science, and that's where innovation comes from.

Actually, that's how I get the idea.

it's not enough

Business surrounding them is required

Together, the three can impact the world.

let's continue

Here's Furby's story in a nutshell

Like I said, I'm a furby co-creator.

I was in charge of body parts and robot movements.

And if you look at it, you'll know what I mean. We were trying to create robots and technologies that could connect emotionally with users.

this is my family

My wife, Christie, and my daughters, Abby and Melissa. Emily, now 17, used to be a tomboy.

Now let's get back to talking about robots.

As I said, I come from the film industry, and at that time I was trying to make an animatronic robot.

At that time, I was trying to make an animatronic robot.

So I was interested in this field.

This one didn't work, but it's the first one This one didn't work, but it's the first one

It's a small piece. I added a moving torso.

It's a little servo driven one, lots of servo motors and parts.

is another work

It has Skeletor (anime character) legs

it's a pony cute pony

I've always been interested in the moving parts of living things.

I worked on Microsoft's Microsoft Barney. I worked on Microsoft's Microsoft Barney.

It's a dinosaur with a purple robe

There were a lot of parts inside that I didn't really need.

And Microsoft was trying to see if they could hold an inventory and sell it.

Compared to toy companies, it was a strange business model.

Anyway, my friend Dave Hampton and I tried to build something like a single-celled organism.

How can we make it with the minimum number of parts?

It's a small Mabuchi motor for 30 cents.

Like many of you, I have a lot of these design notes Like many of you, I have a lot of these design notes

This is the first page about Furby, but art and science come together throughout the notebook.

The reason and how to make it are written

I put a lot of philosophy and thought into this project.

Ideas can't be narrow, you have to dig deep Ideas can't be narrow, you have to dig deep

Here's some preliminary code.

Originally, the Furby only had two eyes and a battery in the bottom.

I made him eat and talk, so his functions became more complex I made him eat and talk, so his functions became more complicated

Move your eyes and ears with one motor -- Move your mouth and body --

It makes you blink. It makes you do these things all at once.

So what I came up with is this straight line diagram that represents the cam and the feedback, and it's pretty successful.

And then we made it more realistic, and we started designing it.

You can see a note to yourself at the top “Full of engineering” You can see a note to yourself at the top “Full of engineering”

It ended up being more than that

Here's the first exploded view and parts, the worm drive.

I built it from there, and this was really hard.

His daily routine was gluing parts together while injuring his finger.

it's my workplace

It's the first cam that powers Furby

Furby half open

The BB bullet is in the box "tilt sensor"

Made entirely out of plastic

There are countless holes in the back of the head

And Furby is complete

No, it's still like a drug-addicted robot.

(Laughter) As you can see, I like little robots.

But "Even if I like you, other people are different"

my wife helped me

This is my wife, Christie, my eternal goddess and partner.

I'm drawing

I'm good at it actually

She began to paint different types of paintings, different color patterns.

Personally, I like the guy in the bottom smoking a cigarette.

It didn't work, but I like it

she made many designs

I decided to make different kinds of things, like the Beanie Babies that were all the rage at the time.

Pink or something with a hair ornament

For some reason this wasn't popular from the beginning

Favorite Demon Furby Cool

Favorite Demon Furby Cool

Anyway, I settled on this look: a fluffy figure, an imaginary character.

This is it.

I made this by dismantling a stuffed cat that I bought at Toys R Us.

Since then, every time I bought a doll or stuffed animal from Toys R Us and left it on my desk, my three daughters hid it somewhere in the house.

I was rescuing dolls and stuffed animals.

(Laughter) There are wires that control Furby's mouth and eyes.

This is server controlled and took a video and said, "Hi, my name is Furby. I'm fine."

When I let go of my hand, I said, "Ha ha ha ha ha" This is the reason why it sold.

Hasbro, then Tiger Electronics, said, "This is very good!

I have 13 weeks until Toy Fair and I'd like to hire you guys to build this."

So Dave and I got the job.

Mostly mechanical problems, it was my job.

I had to study to solve various problems I had to study to solve various problems

And I started working with Solidworks and others, and I started working with Solidworks and others.

When I started working, before SLAs, I couldn't prototype as fast as I can now. Before SLAs, I couldn't prototype as fast as I can now.

Hasbro doesn't have the money for this.

It was just paid to me, money was limited, so I had no choice but to call a friend of a friend who ran the GM prototype factory and the SLA factory that had shut down.

"Let's do it"

Thankfully, they moved the equipment.

Cam made by Hewlett-Packard

for weekend use only

we took the file out on disk

But their computers were closed and they couldn't print.

So I printed it out on clear plastic and stuck it to my monitor.

So I made the parts over the weekend.

It's nearing completion

It ended up being like a little Garfield

Eight months later, it was sheer chaos.

For a while, we'll be making 2 million Furbys a month.

It ended up selling 40 million units.

I didn't expect it to sell so well

Hasbro has made $1.5 billion in sales.

i got a little

And it's back. Why do you do this?

why do i always do the same thing

Of course it's for the children

Three girls are surrounded by Furby

she still has

I'm a little retired and living in peace. I live in Boise, Idaho, on the river. I started Toy Innovation, Inc. I worked with Mattel -- Ivy Ross, who's there.

create another company

I developed a hand-held toy that connects to the internet for teens. It won "Best Innovation" at CES, and I slowed down. I won "Best Innovation" at CES, but I slowed down.

I would like to develop it in earnest.

So we started the Dinosaur Project.

It's a silly idea to clone dinosaurs with all the technology we have today.

I know you can't clone

We took it seriously and tried to make it feel like it was really alive.

It wasn't robotic, it was just serious.

I chose Camarasaurus because it's the most prolific sauropod in North America.

Whole body skeleton found

this is a fossil of a child

I was able to understand

There's a book called "Walking on Eggshells," and it's about finding sauropod skin in Patagonia.

I told the person in charge to use a picture from the book to recreate this bump in everything.

I was pretty stuck

This is a simplified skeleton of a Camarasaurus, the placement is correct.

We've looked at the exact placement to make it look more biologically similar.

Doing this correctly gives it authenticity.

is the motor

From this time on, collaborators began to help me.

this is a skull

It is a skull drawn in the picture

the soft part of the skin

It's the mechanism that's built into the Geneva mechanism.

Manufactured by Solidworks

SLA parts of the same part

It's still rough around the edges, but I've tested it many times.

It's a very close skull to Camarasaurus.

There's a photorealistic eye in the back of the lens.

This is the first exploded/perspective view

This is the first SLA version It's already real and cute

Building robots is a blend of art and science, a cross-border fusion.

I had to flesh out the servo-driven front legs to look like real muscle.

The process of meat attaching

it took a lot of effort

The neck and tail are wired and move smoothly and organically The neck and tail are wired and move smoothly and organically

Of course it's still incomplete

Focused on skin

The skin was the most difficult, and completely different from the rest of the process.

So we hired specialist artists, and we focused on the visual and tactile senses.

we are character designers

I was trying to get closer to the real thing.

So again trial and error with clay

I finally see the shape

The owner of this hand loves dinosaurs, so he worked hard to make dinosaur sculptures. He made everything from spoon-like teeth.

Cut it, cut it, cut it again, cut it

Finally, after 10 million dollars and 4 years, PLEO was completed.

John, can you bring me?

I'm John Sosoka, Chief Technology Officer, and I've done this for our company of less than 40 people.

I don't usually make it public, but I'd like to introduce you to John Sosoka.

(Applause) Thank you, John, go and get back to work.

So -- (Laughter) It's hard... (Laughter) It's Pleo.

incorporates life stage

when you first get them they're babies

We will grow steadily We will learn by taking action

I'm sleeping here please wait

get up pleo

recognize voice

40 sensors all over the body

It has seven computing units, 14 motors, and... it doesn't matter.

cute or not that's what matters

Come on, did you know how to touch?

There's a loud and big thing on that side

Hey

(Laughter) Come on wake up wake up

looks like a child

he looks hungry

Let me show you what he's been up to in four years.

Look, look, it's money, Pleo

(laughs) I did.

This is what an investor thinks... (laughter) through these cute little guys.

What we want is that people need empathy for things in order to be more human.

We hope we can help by creating these lovable little creatures.

They're no longer robots, they're lovebots.

they change

The key is to evoke attachment

I would like to say

Although Yugoby has not yet

we showed you the way

I'm sure it will be of some help

hey pleo

They have a USB and an SD card. They're completely open.

Anyone can connect. (Applause) Thank you -- thanks to John.

Anyone can connect. (Applause) Thank you -- thanks to John.

Everyone can personalize Pleo

(Laughter) I don't care what it's called, but I can change the homeostatic drive.

Children drag and drop and add sounds

In fact, everyone wants to do that kind of thing.

One developer had Pleo put in Budweiser lines and say, "Wazap? (How are you?)."

(Laughter) It seems to be his favorite.

Pleo is small, so I want everyone to pick it up

I think I'm forgetting something. I just want to say one thing: If things go well, Pleo could be your child's best friend.

It also comes with a lot of social responsibility, so-

Pleo is soft, gentle and lovable

May you have wonderful dreams

thank you

(applause)

If you asked me what the hardest thing about psychology would be, what would I say? Which is harder, thinking or feeling?

Many people will say, "Emotions seem difficult

It's so complicated I have no idea how it works

But thinking is very straightforward, and I think it's just a kind of logical reasoning.

I don't think it would be that difficult."

I tried listing the problems

The first problem to think about is what to do with health problems?

I came across an article the other day that said that handshakes are probably the number one cause of illness in the West.

There was a study comparing people who didn't shake hands with people who did.

I have no idea where to find people who don't shake hands, but they're probably hiding.

People who avoid shaking hands are 30 percent less likely to get sick.

could have been 31 and 1/4 percent

So if you really want to stop the spread of disease, start with handshake prevention.

The only way to avoid a handshake is probably to get a sickness that's horrifying to look at, and you won't have to explain it.

Education—How Can Education Be Improved?

The best way to do this is to let them know that what they're listening to is full of bullshit.

To sort out, people will listen more

Pollution Energy shortage Environmental diversity Poverty

How can we create a stable society?

So does longevity There are many issues to consider.

But the question that really needs to be discussed, which is taboo on this topic, is what the population should be.

100 million people, 500 million people

Then many of these problems would disappear.

With a population of 100 million and a proper distribution, even if there is garbage, you can throw it away.

Even if you throw it in the sea, the fish will still eat it.

The problem is how much should be the population

you have to make a choice here

A lot of people are taller than 150 centimeters, and it's a waste of space. If we could make it 1/10th, maybe we'd use nanotechnology or something...

It solves the problem, but I've never heard of research that makes people smaller.

I wish we could reduce the population, but there are a lot of people who want children.

Maybe in a few years there is a solution that will be feasible

Humans have 46 chromosomes. Fortunately, they have inherited 23 from their parents, but they may be one extra or lack, so let's skip the generations of grandparents and great -grandparents and go back to the high -grandparents' generations. There is no reason to be unavoidable. Each child will have 46 parents and will have a group of 46 parents with 15 children.

Isn't that enough? Children will grow up well supported and protected, and the world's population will plummet, and everyone will be happy.

Time-sharing is a little further away

Arthur C. Clarke has written two great novels, "The Fall of the Galactic Empire" and "Cities and Stars."

They're both great works, and they're both pretty much the same story, but they're different before and after the computer was born.

Arthur looked at the previous work and thought it was a mistake.

that there will be computers in the future

In the second piece, the Earth has a population of 100 billion or 1 trillion, all stored in future versions of hard disks and floppies.

millions can go outside at the same time

Once you're out there, you're going to live for a thousand years.

And you can examine yourself and your memories, and edit your memories and modify your personality and so on before going back to hibernation.

There just isn't enough diversity at this rate, so the designers of this city make sure that new people are born every now and then.

Eventually, a person named Alvin thinks this isn't the right way to go, and destroys the entire system.

I don't think the solution you presented is good or wise.

The big problem is that we're not smart enough to know which of the problems we face should be solved.

So we have to build a super-intelligent machine like HAL

You know, in "2001: A Space Odyssey," HAL realizes that the universe is so big, so vast, so deep, that it's incomprehensible to the dumbest astronauts.

What should I do? we can be wise

Compared to chimpanzees, I'd say they're pretty smart, but they're not smart enough to deal with the gigantic problems we face, whether it's theoretical mathematics, economics, or balancing the world.

There is such a thing as living as long as possible.

I don't know how hard it will be, but I think it will work out in a few years.

There's a fork in the road here. Humans live about twice as long as chimpanzees, but very few people live longer than 120 years, and we don't really understand why.

But there are many people who live to be 90 or 100 years old if they avoid risky behavior like shaking hands.

If people could live to be 200 years old, they might be able to accumulate the skills and knowledge they need to solve problems.

Isn't this one way

I don't know how hard it is. Yes, most mammals live only half as long as chimpanzees. Yes, humans live three and a half to four times longer than most mammals. But when it comes to primates, the genes are almost identical.

Geneticists still don't know what they're doing.

I don't think you should read anything about genetics about genetics published while you're alive.

(Laughter) Genetic research, like neuroscience, is very fast-paced.

If you modify four or five genes, a person might live to be 200 years old.

It may be 30 or 40, but it won't be hundreds.

There's going to be a lot of discussion about this, the ethicists, the people who see what's wrong with whatever we think.

(Laughter) Ethicists don't see the value in making any kind of change.

Of course, we are still not responsible for the consequences, just like resistance to cloning.

Two people meet by chance and have a child. They both have a few bad genes.

By chimpanzee standards, he's a very good kid.

As people live longer, they face the problem of population growth, because when people live to 200 or 1,000 years old, they can only have one child in that lifetime.

Then there will be no labor force.

As Laurie Garrett pointed out, a society without working-age people would be a real disaster, and things would be much worse, because there would be no one to educate the children, and no one to take care of the elderly.

We're talking about longevity, but of course, 200 isn't 200 as we think it is now, although 200 is usually dead.

The brain is made up of 400 parts, each of which seems to have a unique function.

I don't really know the details, but I do know that there are a lot of different things out there.

Not everything works together all the time, and Freud's theory is that most work counteracts each other.

Imagine yourself as a city with a hundred resources, and when you're faced with fear, you'll likely give up on your long-term goals and focus solely on solving the fear you face.

You don't do anything else, and you become paranoid.

For example, food becomes more appealing when you're hungry.

Emotions are a highly developed subset of abilities.

Emotions aren't thoughts with something added. Emotional states are the removal of 100 or 200 of the resources that are normally available.

If we can conversely think of emotions as something less than thoughts, it can be very productive, and hopefully in the next few years we'll be able to show that it will lead to intelligent machines.

I'm going to skip the rest, but how do we build that intelligent machine? (Laughter) The core idea is that at the core of any truly intelligent machine is recognizing that it's faced with some kind of problem.

It's this type of problem, so you decide that this approach works for this problem.

I think a major challenge for psychology in the future is to classify the types of situations and disorders, and also classify the available tools, and think about combinations.

It's kind of like Pavlov's conditioned reflex. Psychology lost its first hundred years to the trivial theories of how people learn to react to situations. What I'm saying is that we've also designed large, messy systems with thousands of parts, and we've gone through many stages, and now we're confronted with the central problem of psychology.

The question isn't what the situation is, but what kind of problem is it, what kind of strategy is it, how do you learn it, how do you put it together, how do truly creative people come up with new ways of thinking from the available resources, and so on.

Over the next 20 years, I hope we can move beyond the traditional approaches to artificial intelligence -- neural nets, genetic algorithms, rule-based systems -- and I want to raise the point a little bit higher and build a system that uses all of these things in a way that fits the problem.

Genetic algorithms are also useful for certain problems.

(laughs) Thank you.

(applause)

good morning david rose

I've been an entrepreneur a few times, and then an investor.

I raised tens of millions of dollars myself from VCs in a PowerPoint presentation to VCs.

Since then, I've been on the other side of the equation, managing investments in multi-million dollar companies myself, and giving PowerPoint presentations.

I think it's safe to say that I know a little bit about how to give a presentation.

What is the most important thing VCs are looking for when they go to present their new business idea?

Of course, there are all kinds of things: business models, finances, markets, overall, out of all the things that need to be done.

What is the most important decision for VCs to invest or not?

Anyone know what?

Audience: people

Who? That's you! That's right

So the ultimate goal of presenting to VCs is to convince them that they're entrepreneurs who will get a lot of returns if they invest in them.

But how? Can't you?

"Hello, I'm a really nice guy, you should invest in me."

You only get a few minutes to present to a VC. Normally, a presentation to a VC -- about 15 minutes for an angel investor, less than 30 minutes for a VC -- people's attention span declines after 18 minutes.

Test results show, so 18 minutes, 10 minutes, or 5 minutes.

A ton of different characteristics have to be communicated In fact, 10 characteristics need to be communicated During the presentation... What is the most important thing you have to communicate?

what?

Audience: Honesty

Oh my God!

I didn't even give you a hint

yes honesty is the key

The ones I want to invest in, the ones I want to bet on, are the ones who are honest, not the ones who make me wonder who they care about or what they do...

Honesty is the most important thing, so what's next to honesty?

do you understand this

Audience: Confidence

Delicious!

Passion is

And here's the thing -- entrepreneurs are people who are inherently people who put aside other things, start new things, create things, put their hearts and souls into it.

So you have to communicate your passion, if you can't have it.

How can other people be so passionate? Who do you think will invest? That's why honesty and passion are the most important

On top of that, there are many other elements that must be included in the presentation to the VC.

Experience You have to say, "I've done it before." Start-up to value creation, from start to finish.

"I've done it before," and that's why VCs want to invest in entrepreneurs.

Even if you don't do it right the first time, you learn a lesson and you do it much better the next time.

In addition to that, the experience of starting a business or running something, it doesn't matter if it's not a business, it can be a school organization or a non-profit organization.

Next is knowledge

For example, the human genome map

If you want to be a developer, you should know what the human genome is, you should bring your specialty.

You can't say, "I don't know anything about this business, but I have a good idea.

I don't know who my competitors are, and I don't know what the market is like."

You gotta know the market You gotta know your field You got the skills to run the company next

If you are a tech company, you also need technical skills

Marketing and sales management skills are also required

But no one has all the skills

Very few people have all the skills needed to run a company.

So what else do you need? leadership

You have to convince us that you've built a team that has all the necessary ingredients...

Your charisma, your management style, your ability to attract, inspire, and motivate your team to join...

So what else would VCs want to know on top of that?

I also want to know that you are committed

To persevere until the end...

All I want to ask is, even if I'm about to die, I'll take my last breath and hook my fingertips and survive Protect my money

Makes me more money...

I hate people who try to run away whenever they get the chance, because bad things always happen.

nothing bad happened

There's no such thing as a venture company.

i want to know

You also need a vision, you have to see what's going to happen next.

I don't want "imitation" products. I want to find people who can change the world.

On top of that, we need realism, because changing the world is great, but it doesn't always happen.

Before we can change the world, bad things happen, we have to get through it, we need rational planning and people.

And finally -- the reason they're asking for money from me isn't the money itself, it's my support.

You have to be able to teach, and it's also important to have the ability to listen.

We are experienced -- VCs and angels making investments --

I have an experience, so I would like to know if you would like to hear the experience.

So how can you tell all 10 in 10 minutes? Without exaggerating...

Don't say things like, "I'm very honest -- please invest!"

without saying it directly throughout the presentation

I have to tell you Think about it in chronological order It's starting I'm going in through the door

VC knows nothing about you

From there, it pulls you into the emotional world --

All presentations are more or less emotional, up and down, right?

from the beggining to the end...

So the first thing you have to do when you walk into the room is draw an arc for the entire presentation, and you have to start like a rocket.

In the first 10 seconds -- 10-30 seconds in longer presentations -- you have to grab their attention.

In my case, in a powerpoint presentation

raised tens of millions of dollars

We also invested tens of millions of dollars, that's it, that's enough.

This is what matters. People will say this is counterintuitive, whether it's a story or an experience.

You have to attract the emotional attention of the VC to yourself.

In the first few seconds...

And from there, you've got to ride a solid, steady updraft, from start to finish.

Everything must be made to reinforce this

It's getting better and better, and it's gotta get better and better Heading up to the end, at the very end, Boom! You pull them in, they kick them out of the arena, they get their emotions pumped up, they cut the check on the spot.

Let's just make them throw money at you before you're gone So what do we do?

First of all proceed logically

If you take a step back or miss a step, imagine you're climbing a flight of stairs with missing steps or different heights, and you have to stop and do something about it.

Let's proceed logically in a nice way

First, I'll tell you what the market is, and why we're doing it.

And then I'll explain how we're going to do it, and what exactly we're going to do, and how we're going to do it.

The whole feeling is important. It has to flow from the beginning to the end.

I must also say that there are touchstones to explain in connection with other worlds.

For example, mentioning a company or business basics you've heard of...

I want to know something I can imagine. Anything that I can see that someone else has acknowledged would be a good test.

Sales, awards, someone did it before, beta test results were good...

Anything, I'd like some validation, not just that you're saying it, but someone else -- or something else -- that makes sense...

Secondly, since I'm looking for the "upside," I need credible upside.

Be upside and be credible

Upside is not enough to say, say, five years from now, we're going to sell a million dollars a year.

If you say you can sell a billion dollars a year, you can't trust that, and you need both sides of that.

On the other hand, there are many times when I lose motivation.

You've lowered your emotional level and you've got to recover from it

For example, what I know to be untrue

To say, "There's no competition. We made a product like this."

There are no people." or...

There's a good chance I know someone made that product the moment you said -- Boom! After that, you only hear half the story.

Things that make you think, things that you don't understand stop the flow of your presentation because you have to jump thoughts in your head.

You have to treat it like you would treat a 6th grader, and you have to do it, and without being arrogant...

It's very difficult

Works really well if you can

Don't be inconsistent in your presentation. Let's say you said something was $10 million in sales, and then the next slide said $5 million.

Well, one might be gross sales and the other might be net sales. All the numbers should be consistent with each other.

And finally, mistakes, typos, silly mistakes, misplaced lines, etc. How can someone who can't give a good presentation run a company?

all these things come into play

So the best way to get better is to look at the good stuff, look at the people who have done it in the past, the most successful technology leaders in business.

See how to present

Bill Gates power point presentation

I'm explaining Windows

Is this how you make a good presentation? What do you think?

No. So who should we follow?

No, it's funny! There's another great here, right? it's steve jobs

Perfect This is the ultimate presentation OK?

Here we are, a little guy in black jeans or something, standing on an empty stage.

where would you look You see him! this is steve jobs

Long bullet points and lists of everything

That's no good, no long bullet points

So what do you want? short bullet points

But do you know? Better yet, no bullet points

I'll just post the headline there Do you know?

How many bullet points and headlines does Steve Jobs use?

is zero

So what do we do? The best is an image, just a simple image

Look at the picture -- a picture is worth a thousand words

If you look at the picture and understand it, everything disappears

Then you have to look at me Look at me Why am I a great person Why would you want to invest in me And why does this make sense

Now, we have very little time left, so let's take a quick look at what you need to include in your presentation.

First, how do I start? This is no good.

I know the date and who I am and what you're presenting I don't need all of that

Show company logo only

When you see the logo, it's like it's connected to your brain, and it's coming back to you.

And then I do a quick 15-second or 30-second introduction to grab your attention.

After that, I'll give you a quick business overview.

You don't have to spend five minutes Two sentences are enough

"I'm building a product for the XYZ market," or "I'm selling a service to help someone do X."

It's like the picture on the outer box of a jigsaw puzzle

it tells the background

It gives you the whole framework of what we're going to describe, and then you'll be able to relate what we've talked about so far to everything else.

Now it's finally here -- tell me who your management team is.

It's useful to say you did. Next, I want to know the market -- the size of the market. Why is that market worth targeting?

I want to know the product Very important

This isn't a product presentation, it's not a sales presentation, so I don't want to know all the details.

I want to know -- what is this in short?

If it's a website, I'll show you a screenshot, no live demos.

Never do it

We'll do a recorded demo or something that shows why people buy the product.

Now that you know what you're selling, let's talk about how you make money.

I would also like to know what kind of business model is per unit and what products are actually sold...

I also want to know who you're trying to sell to, in terms of customers, and I also want to know if there's a relationship with them that specifically supports you, whether it's a distribution partner or a manufacturing partner.

I want to verify that I can show that it's bigger than this little thing right here.

On the other hand, there will always be competition. A company without competition.

It doesn't exist, even if competition is the old way of doing things.

I want to know exactly what the competitive landscape is, so I can determine where it fits in the picture.

On the other hand, I'd also like to know what's special, if you know what your competitors are doing.

How do you keep your competition from eating your lunch? All of this comes down to financial summaries.

It's a must -- you can't present to a VC without showing your financials financial statements for the last 1-2 years.

Or you need something from the time of establishment

We also need forecasts for the next three to five years. Five years might be too long. Four years would be fine.

The product-based business model you described

I would also like to know how it will be transformed into a corporate model How many products do you sell?

I want to know how much you earn per product and what the driving force is

This year we'll have 1,000 customers, next year we'll have 10,000, sales will increase by that much, and that's what we're going to invest in for the next few years.

Now that you have the big picture, the next thing you want to know is how much money you're trying to make on your investment.

How useful is it to open an overseas factory in China?

Do you want to spend it all on sales and marketing, or do you go to Tahiti and play, but that raises the question.

Here you should say how much money you need

$5M Needed -- What's the Valuation?

$2 million for 100,000 shares How much have you raised so far? Who are the investors?

I hope you've invested as an individual, because I'm following you, if you don't invest yourself, who will?

I also want to know if friends and family are investing Are there any angel investors Are there other VCs? What is your capital structure so far?

And finally, after all of this, having said all that, I have to come back to the conclusion that this is that rocket that goes up.

all positive positive

more positive

Everything you said got me, it all makes sense

i think this is really cool

So we go back to the logo, just the logo on the screen.

I see the logo -- ok

And I'll come back to you, because there's nothing else to see.

One last time, I have to say "BOOM!"

So how do we remember the order and content of doing this here?

You may have noticed I'm not looking at the screen here

In this room, the screen is set in front of me, so I can't see it even if I want to.

So how do you know what's written?

There's a laptop in front of me, but they're looking at me, they're looking at the screen.

what do you think i'm looking at

Think you're looking at the screen? What I'm actually looking at is a powerpoint

It's a special edition, showing the previous slide, the next slide, and my notes.

Bundled

If you're using Apple's Keynote, even better.

There's also a piece of software called "Ovation," which Adobe just put out last summer, where you can run everything on a timer and see what's on the screen.

So in the final roundup, I'll take you to the moon.

I usually do the Top 10, but I don't have time today.

Ovation and presenter tools are fine

I know exactly where you're going so I can pace myself and finish everything on time...

#4 Always use the remote control

Did you see me touch the computer? No I didn't. Why?

Because I have the remote here. Always use the remote. #3

Handouts are not presentations

If you follow my advice, you'll have a clean, zen-like presentation. It's good for telling people who you are and getting people emotionally involved, but it's not very good as a handout.

No. 2 Not reading the manuscript Can you imagine? "You should invest

It's really good." You can't do that, right? don't read the manuscript

And the number one presentation tip is to never look at the screen.

Trying to make a connection with the audience, because you should always have a one-to-one connection

The screen is floating behind you, and it's meant to complement you, not replace you.

I want to start with the words of Helen Keller, the amazing woman that everyone admires.

She left us with a very profound quote: "Science may have found solutions to many ills, but it has not solved mankind's greatest plague, which is indifference."

So we know that indifference is expensive, especially in democracies.

And yet when you think about why people don't get involved, why they don't become activists, a common one is that they're exhausted by domestic responsibilities, especially women.

You know, women are so repressed.

Many women have suffered a great deal of trauma and aggression in their lives.

That's why women think they can lead themselves and get out of the situation.

It's very difficult to realize that you can change the world.

And many other women have to do everything themselves

Because they think they have full responsibility for their families, they find it difficult to delegate or ask for help with that responsibility.

I feel shame and guilt

But you have to do something, because otherwise you wouldn't have the time to volunteer to support the many movements that are pressing right now.

Shopping is the only thing women can spare a little time for, you know?

(Laughter) Especially when you go to buy things you don't need.

(laughs) I can't take it with me to the afterlife.

(Laughter) Unless we live simply, other people cannot live simply.

And when we think about what kind of legacy we want to leave to our posterity, we think about leaving a legacy of justice.

Because it's not just an exemplary legacy, it's something you can be proud of for the rest of your life.

If you leave behind a lot of material possessions, there will only be conflict, and you will hate each other.

Keep that in mind when considering a job

The other thing that must be done to finally free women and enable the volunteer work needed to change this world is to provide young women with a different education.

Unfortunately, societies around the world teach women to be victims.

We're not taught to protect ourselves, we're not taught to be self-reliant, we're not taught to defend ourselves.

After all, when you actually look at the animal kingdom, you know whether the most ferocious are males or females, right?

female, right?

So something went wrong for women at the top of the animal kingdom.

(Laughter) As an example, let me tell you how I came to be able to make my case.

I was really lucky when I was 25 when I met a gentleman named Fred Ross, who runs a chapter of the Community Service Organization, in my hometown of Stockton, California.

It's a grassroots organization, and I was recruited as a volunteer.

One day, while we were sitting in our office, a man who worked on a farm walked in.

He was paralyzed, could hardly walk, and was on crutches.

he needed help

I needed an assistant to accompany me to the welfare office and help me with the application.

That's why I volunteered to be your companion.

But when I went to the welfare office, the staff wouldn't let me apply for him.

I don't know what to do, I'm at a loss

I went back to the office and said to Mr. Ross, "The welfare office won't let me apply for him."

And Mr. Ross said to me very sternly, "I'm going to tell you to go back to the welfare office right now and see the person in charge."

"And demand his application."

I thought, "Eh, can I do it?"

(Laughter) That's what helped me overcome my anxiety and fear.

When I told him to go to the welfare office and meet the person in charge,

The person in charge really came out, and the staff had to apply for Louise's welfare.

He was disabled for himself and his family.

But that taught me

I can also claim

Cesar Chavez and many other volunteers learned a lot from Mr. Ross.

It showed us that we can demand it, especially that of civil servants.

This is something that should always be kept in mind, but any civil servant — okay? working for us

Because we pay civil servants' salaries with taxes.

civil servants should serve us

Some people become leaders, but not all

(Laughter) Sometimes a leader emerges from there.

In addition, Ross told me that voting is incredibly important.

It's not just about voting, it's about going out and getting people to vote.

door to door

I call and talk to voters because many of them have questions and don't know how to vote.

And unfortunately, in many countries, people are unable to vote, because of voter suppression in other countries, as well as in the United States.

But what's important is that if you can get out there as individuals and talk to each other, you'll feel less helpless and be convinced that you can vote.

So I'd like to share with you the example of one woman from our Dolores Huerta Foundation, and to show you that people have powers that they don't even realize they have.

But once you realize that, you can do miracles.

Leticia Prado is an immigrant from Mexico who only had an elementary school education and speaks very little English.

But she was very worried because the middle schoolers in her town, the Weedpatch area of ​​Central Valley, California, couldn't go out or play in the schoolyard, because the air in southern Kern County, California, was pretty polluted.

So she went with her husband to get a bond issued to build a new, state-of-the-art gymnasium for middle schoolers.

it was a big success

And then I heard a rumor that the principal was going to stop serving breakfast to the kids who worked on the farm, just because there was too much paperwork.

So Leticia joined the Board of Education herself.

Continued to serve breakfast and fired the principal.

(Laughter) (Applause) There were other rumors about corruption in the local water company.

So Leticia joined the water company herself.

After reviewing all our finances, we discovered that $250,000 was missing from our bank accounts.

So she reported it to a grand jury, and there were a few arrests.

This is just one example of a woman who never attended high school or college, but she discovered power.

On top of that, when she recruited local residents to run the government office, surprisingly, all of the applicants were self-nominated.

I think Leticia really embodies the words of Coretta Scott King.

I would like to share with you the words, "There will be no peace in the world until women have power."

(Applause) I changed the words to read, "We won't have peace in the world until feminists have power."

(Laughter) You know the difference, right?

In other words, a feminist is someone who stands up for reproductive rights, for immigrant rights, for the environment, for LGBT rights, for union and labor rights.

(Applause) So men can be feminists too.

(Applause) So when we think about feminization, we should also think about how we feminize policy, not just in major countries, wealthy countries like the United States, but domestic and foreign policies around the world.

One way we can end war and have peace is to make sure that the richest countries in the world help the developing world.

I have done this in the past

After World War II, when the war ended and Japan and Germany were devastated, the United States gave those two countries a lot of tax money so they could rebuild their economies and businesses.

you should be able to do the same

Can we think of ways to help other countries?

To give you an example of the problems we face in America,

Right now, there are a lot of refugees from Central America on the US border.

Why do they leave their beautiful hometowns where we travel?

'Cause there's no chance at home

So we think, "We have bananas."

How many millions of bananas are sold in America and around the world in a single day?

do you think it is consumed?

So are people in Central America profiting from the bananas we consume?

not getting

Profits go to American companies

i think this is wrong

If part of the money we pay for bananas goes to people in Central America, they don't have to leave their homes.

No need to apply for asylum at the US border

That probably keeps many kids from being separated from their parents.

By the way, it is well known that there are countries where education is practically free for all citizens and medical care is free.

Cuba

Cuba has universal health care and free university education.

population is 11 million

So if a poor country like Cuba has these resources, why doesn't a rich country like the United States do the same?

i think i can

(Applause) But I also know that it won't happen unless we, the American people and the rest of the world, elect representatives who truly care about their voters, who care about their people, and who commit themselves to using the resources they have for the people, not for war.

So how do we make it happen?

Stop being indifferent. Get more people involved.

If there is no democracy in America, there will be no democracy anywhere in the world. Public participation is essential.

It's important for all of us to go out and say, "Let's stop the indifference, get out on the sidewalks, join the march for peace and justice, and let's make Coretta Scott's vision a reality and bring peace to the world."

We recently had midterm elections in the United States.

What happened then?

Many women, young people, people of color, LGBT peers, all elected to Congress.

Why did this happen?

because so many women took part in the march

Because there was a women's march in America.

women's marches all over the world

We now understand that we have this potential.

we have the potential to remove indifference

If you get everyone involved, everyone will, and I think that's what made Coretta Scott's vision come true.

Ladies and Gentlemen, just remember one thing in the world: we have power, the poor have power, we all have power.

But to get to the peace we want, we have to get everyone involved.

What shall I say?

"Is it possible?"

"You can do it!"

In Spanish it's "Sí, se puede."

thank you

(applause)

A year ago, I talked about a book that was just in the final stages of being put out, and today I'd like to talk about the controversy it caused.

The title of the book is "Blank Slate," a term that derives from the popular notion that the human mind is by nature blank, and that it's entirely composed of social life, culture, parenting, and experience.

In the 20th century, the idea of ​​the "blank slate" had a great impact.

Here are some quotes to show that: "Humans have no nature." Historian José Ortegay Y Gasset "Humans have no instincts." Anthropologist Ashley Montagu.

There are many reasons to doubt the "blank slate" theory, some of which are based on common sense.

And as I've been told many times, and anyone who has had two or more children, you know that they come into the world with certain traits and talents, and not everything comes from the outside.

And if you're a household with both children and pets, have you noticed? Children learn to listen and talk, but pets don't learn to talk, probably because of some inherent difference.

Even those who have dated the opposite sex know that women and men are not the same.

There's a growing body of research these days that proves that humans aren't "blank slates" after all.

One of them, in the field of anthropology, is the study of "universal human characteristics."

As anyone who has studied anthropology knows, one of the anthropologist's professional pleasures, so to speak, is to show how exotic other cultures are, and how some areas do things the exact opposite of how we do things.

But on the other hand, if you look at what the world's cultures have in common, there are a lot of behaviors, feelings, and worldviews that are found in all 6,000 cultures around the world.

Anthropologist Donald Brown sought to bring together all the commonalities in areas ranging from aesthetics, affection, and age status, to weaning, weapons, weather, dominance, and the worldview of white.

And there's a growing body of research in genetics and neuroscience demonstrating that the structure of the brain is complex.

Here's a recent study by neuroscientist Paul Thompson and his colleagues, who used MRI to measure the distribution of brain gray matter -- the brain's cortex -- in a large pair of subjects.

They color-coded the interrelationships of gray matter thickness in different parts of the brain, with irrelevant areas as purple, and colors other than purple as statistically significant associations.

Now, if we pair randomly, we'll end up with something like this.

By definition, two randomly chosen brains should have no correlation in the distribution of gray matter in their cortices.

This is what happens when you have fraternal twins with half the same DNA.

As you can see, many parts of the brain aren't purple.

This is what happens with clones and identical twins where all of the DNA is the same.

We find a strong correlation in the distribution of gray matter across the cortices of the two brains.

Now, these aren't just anatomical differences, like the shape of earlobes, but they also affect how we think and act, as seen in this famous cartoon by Charles Adams: "The Malifert Twins Meet By Chance, Separated Shortly After Birth."

As you can see, two inventors with the exact same invention on their laps meet in a patent attorney's waiting room.

This cartoon is not incredible. Identical twins who were separated at birth and tested later in life have striking similarities.

This phenomenon is present in all identical twins that scientists have studied, but it's much less common in fraternal twins that are separated shortly after birth.

My favorite example is the case of twins, one of whom grew up in a Nazi family in Germany, Catholic, and the other in Trinidad, in a Jewish family.

When I entered the lab in Minnesota, we both wore the exact same dark blue shirts with shoulder headdresses, we both liked to dip buttered toast in our coffee, we had rubber bands around our wrists, we had a habit of flushing the toilet after and even before we used it, and we both loved to sneeze in a crowded elevator and watch the people around us freak out.

It may sound incredible, but you can repeat the psychological test over and over again with the same results, which means that identical twins who split up shortly after birth have striking similarities.

Now, both common sense and scientific data cast doubt on the theory of the blank slate, so why is this idea so compelling?

There are many political reasons why people like this idea.

First of all, if we are blank slates, then by definition we are equal, because zero equals zero, it ends up being zero.

But if something was written in stone, some people would be better off than others, and according to that line of thinking, discrimination and inequality would be justified.

Another of humanity's political fears is that if we were a blank slate, we could make humans perfect, which is the long-held dream of perfecting our species through social engineering.

On the other hand, if we're born with certain instincts, it could be that they're dooming us to selfishness, bigotry, and violence.

In my book, I argued that these were in fact irrational inferences.

In short, first of all, the concept of fairness is not the same as the concept of sameness.

And when Thomas Jefferson wrote in the Declaration of Independence, "We hold the following facts self-evident, that all men are born equal," he does not mean that "all men are clones."

Rather, all humans should be equal in their rights and should be treated as individuals and not judged by the statistics of the particular group to which they belong.

And if we're born with inferior instincts, it doesn't automatically lead to inferior behavior.

Because the human mind is a complex system of many parts, and one part can hold back the other.

For example, because virtually all humans are born with morality, and we have great reason to believe that we have cognitive abilities that enable us to learn from the lessons of history.

So if a person has selfish or greedy impulses, it's not just in the brain, it's other parts of the mind that can counteract those impulses.

In this book, I have written about these issues and many others that have generated outrage and controversy, including art, cloning, crime, free will, education, evolution, gender differences, God, homosexuality, infanticide, inequality, Marxism, morality, Nazism, parenting, politics, race, religion, depletion of resources, social engineering, the dangers of technology, war, and more.

Needless to say, tackling these problems is fraught with danger.

When I finished writing the first draft, I sent it to my peers to ask them what they thought, and the response I got was something like, "You should put surveillance cameras in your house."

"I have no hope of receiving awards or work in the academic world."

"You should tell the publisher not to put your address in the author bio."

"Do you have a tenured professorship?"

(Laughter) The book came out in October, and I haven't had a bad experience yet.

In fact, I had reason to be nervous. There were times when I was really nervous because I knew what had happened to people who put forward controversial theories in behavioral science or made disturbing findings.

As I've written in my book, there are many cases where people who make controversial findings and claims are slandered, called Nazis, beaten, or threatened with criminal prosecution.

You never know when you'll fall into this pitfall

My favorite example is a pair of psychologists who studied left-handedness, and they published data that showed that, on average, left-handed people are more likely to get sick, have more accidents, and live shorter lives.

It's not clear if that notion was accurate after that, but at that point the data seemed to support that result.

And soon they were under fire from angry left-handers and their mouthpieces, angry letters, death threats, bans on the topic from scientific publications, and so on, and they were really scared to open the mail because of the hate and abuse they didn't expect.

Well, it's been six months since the book came out, and it's still early evening, but luckily I haven't had a bad experience.

I haven't been in a terrible job crisis, I haven't been expelled from Cambridge.

But what I want to talk to you about today are the two key issues that generated the strongest response in the 80-odd book reviews that The Blank Slate received.

I'm just going to give you that list, and guess which two. I'd say those two topics account for probably 90 percent of people's reactions in a lot of book reviews and radio interviews.

It's not violence, it's not war, it's not race, it's not gender, it's not Marxism, it's not Nazism.

The two are art and parenting.

(Laughter) I'll explain why they're so outrageous.

first is art

In the long chart of universal human traits that I showed you a few slides ago, there was art.

No society, however remote, in the world has yet been discovered that does not have what is considered art.

Visual arts, adornment of the body and appearance seems to be one of the universal human traits.

Storytelling, music, dance, poetry, etc., are found in all cultures, and many of the themes and motifs in art that delight us are found in all human societies, from their fondness for symmetry, their use of repetition and variation, and even their peculiarities, such as the fact that a line of poetry around the world is nearly three seconds separated by pauses.

On the other hand, in the second half of the 20th century, it is often said that art is in decline.

I have 10-15 articles in high-end magazines bemoaning the decline of contemporary art.

Here are some representative quotes: "We can say with some confidence that our age is one of decline. Our cultural standards are lower than they were fifty years ago. The evidence of this decline is evident in all areas of human activity."

This is a quote from TS Elliot over 50 years ago

A little closer: "Today the viability of high culture is becoming more and more questionable.

Full-scale bookstores cut branches, non-profit theaters survive by commercializing their repertoire, symphony orchestras lighten their programs, public television relies more on reruns of British comedy, classical radio stations dwindle, museums get big hits, exhibitions turn to dance, dance is dying.”

These are the words of the famous stage director and critic Robert Bleustein in The New Republic magazine about five years ago.

art is not dying

I don't think it would surprise anyone in this room, but by any standard, the arts have never been more successful.

Of course, there's a whole new art form, a new medium, and you've seen a lot of examples in the last few days.

Demand for art in all its forms is skyrocketing by any economic indicator, as seen in the price of opera tickets, the number of books sold, the number of books published, the number of songs released, the number of new albums, and so on.

If there's a grain of truth in the complaint that the arts are in decline, it's in three areas.

One is the elite art from the 1930s onwards, where the majority of the repertoire, for example, is music played by the major symphony orchestras created before 1930, or works exhibited in the major galleries and prestigious museums.

Also, 40 or 50 years ago, in the world of literary criticism and analysis, critics were considered the champions of culture. Today, they're the laughing stock of the nation.

And college arts and humanities departments are underperforming by many standards.

Students are fleeing in droves, and colleges are cutting back on investment in the arts and humanities.

here is my analysis

They weren't asked, but by their own account, they needed as much help as they could-

I would suggest that it is no coincidence that what we see as the decline of elite art and criticism coincided with the widespread denial of humanity at the same point in history.

One famous quote, if you look on the web, can be found on the main schedule of many English classes: "Human nature changed in December 1910 or thereabouts."

This is a paraphrase of a Virginia Woolf quote, but there are many opinions on what Woolf really meant.

But when you look at these lecture schedules, it's clear that the way we appreciate art that has existed for hundreds and thousands of years has been abandoned in the 20th century.

The beauty and joy of art, perhaps one of the universal human traits, has come to seem too sugary and silly and over-commercialized.

Barnett Newman famously said, "The driving force of modern art is the desire to destroy bourgeois or vulgar beauty."

I'll give you an example

This is a representative painting of the female body in the 15th century, and this is a representative painting of the female body in the 20th century.

Something must have changed in the way elite art appeals to the public's senses.

In fact, modernism and postmodernism were visual arts without beauty, literature without story or plot, poetry without rhyme or rhythm, architecture and urban planning without ornamentation, modest size, greenery, or natural light, music without melody or rhythm, criticism without clarity, aesthetic considerations, or insight into humanity.

(Laughter) I'll give you an example to prove my point.

This is Judith Butler, a professor at the University of Berkeley, one of the most famous English literature experts of our time.

This is an example of her analysis: "Capital is understood to give structure to social relations in a way that is relatively homologous to the hegemonic view that power relations follow repetition, convergence, and re-segmentation. A movement from the structuralist view brought the question of temporality into thinking about structure, and from a kind of Althusserian theory that took structural totality as a theoretical object, the contingency possibility of structure, took structural totality as a theoretical object. It marked a shift towards a theory that initiated a new conception of hegemony as a conjunctive one."

It is like this

By the way, this is one sentence, and if you analyze the part of speech, it's grammatically correct English.

In "Blank Slate," I'm not saying that art in general is, but that the elite art and commentary of the 20th century despises beauty, comfort, clarity, insight, and style.

People distance themselves from elite art and criticism

It's a mystery why?

This is probably the most controversial claim in the book.

Someone asked me if I put this allegation in the book to divert anger from discussions of gender, Nazism and race. No comment on that.

But it certainly provoked a strong reaction from many university professors.

Another tricky topic is parenting

Let's start with this question: We've all been coerced into taking advice from the childcare complex at one time or another.

Here's one of the most famous quotes from a mother who struggled with unsolicited advice: "Too much parenting advice bothers me.

They must be given plenty of physical activity and exercise habits to help them grow up to be active, healthy adults.

We have to play all kinds of educational games to make them grow smarter.

In addition to that, there are many other kinds of games such as clay play for dexterity, word games for reading skills, fine motor play, whole body motor play, and I feel like I have to devote my life to thinking about what to do and play with children.”

I think any modern parent would sympathize with this mother.

Here Are Some Solemn Facts About Parenting

Most parenting studies based on this advice are useless, because they don't take genetics into account. These studies look at the correlation between what the parents did and how the child became, inferring a causal relationship: parenting makes the child.

Parents who talk to their children a lot have children who are eloquent, parents who hit their children have children who are violent, etc.

And most of the research doesn't rule out the possibility that you inherited your genes from your parents, that your genes make your children eloquent or violent.

There's no way to know if these conclusions are valid unless the study is redone with adopted offspring that are influenced only by the environment, not the genes.

Studies that take genetics into account have some solemn consequences.

Remember the Marifert twins, separated shortly after birth, reunited at a patent office, and strikingly similar.

Now what if they had grown up together?

You might think they were more alike, because they shared not only their genes, but their environment.

must be very similar

Mismatched, identical twins separated at birth, or any siblings, are no less alike than if they were raised together.

Everything that happens in a given environment over the years doesn't seem to have a lasting effect on your personality or intelligence.

Another study, in a completely different way, found that adoptive siblings who were raised together are the exact opposite of identical twins who were raised separately: they share the same home, same parents, same environment, different genetics, but ultimately they're not alike at all.

Yes, two different studies have come up with the same results.

What this suggests is that children are not, in the long term, made up by their parents, but in part -- just to say in part -- by their genes, and by their culture -- by the broader culture of the country, and by the children's own culture, for example, by peer groups. I heard Gilles Sobre today, and that's what matters to children.

Finally, I would like to conclude by returning to the topic of choice, by chance in everyday life.

I believe that the sciences of human nature -- behavioral genetics, evolutionary psychology, neuroscience, cognitive science -- are going to challenge an ever-increasing variety of dogmas, careers and entrenched political belief systems.

and it presents us with a choice

The choice is whether a certain fact about people or truth should be considered taboo, or we should be forbidden to know it because it doesn't do us any good, or should we honestly explore it.

My own answer comes from the great 19th-century artist Anton Chekhov, who said, "You grow when you see yourself as you are."

I can't speak more eloquently

thank you

(applause)

this is hogevik

It's one of the districts in a small town near Amsterdam in the Netherlands.

There are 27 houses here, each with 6 or 7 people.

There's also a small shopping mall, where you'll find restaurants, pubs, supermarkets, and common rooms.

There are roads, there are alleys, there are theaters.

Actually, this is a nursing home.

A facility for people with advanced dementia, where people who need 24/7 care and support live.

Dementia is a painful disease, and we still don't have a cure for it.

Countermeasures against dementia have recently become a serious social problem worldwide, and the seriousness of the problem is increasing for citizens, politicians, and the world at large.

Admission to nursing homes often requires a waiting list

Most of the people with dementia who come to these facilities are women.

One of the reasons is that women are accustomed to taking care of others, so women can manage to care for their husbands with dementia.

Dementia is a disease that affects the brain

brain is confused

Patients lose track of time and have no idea what's going on or who they're dealing with.

the patient is very confused

That confusion can lead to anxiety, depression, and even aggressive behavior.

This is an old nursing home.

This is the facility where I worked in 1992.

i was a care manager

I used to talk to the people who work here that the care we're doing there isn't the care we want our parents or our friends or ourselves to take.

One day we said, "Just talking about this doesn't change anything.

We are responsible for the operation of the facility.

Let's somehow change this situation and make it a facility where our parents want to move in."

We talked a lot about what we saw every day. Patients who entered our nursing home were confused about living there, because what they saw was a hospital-like environment with doctors and nurses and paramedics in white coats.

I don't understand why you live there

I was looking for a place to escape from there

I was looking for an exit to go home

In the midst of all this, we realized that we, the facility staff, were confusing people with already confused brains.

was adding confusion to confusion

the patient didn't need it

Everyone wanted our help to live a normal life and help them deal with dementia.

Everyone wanted to live in a normal house, not a hospital ward.

Everyone wanted a normal home life, where the smell of dinner being cooked in the kitchen drifted through the air.

Or where you can freely go to the kitchen and pick up your favorite food and drink

I wanted that kind of environment.

Our task was to create such an environment.

I said that we should create an environment that feels like home, rather than groups of 15, 20, 30 people living in a hospital ward.

Small groups of 6-7 people live like one family.

like friends living together

To do that, try to choose people who share similar values, because when you live together, you're more likely to form real friendships.

We interviewed families of residential residents and asked them, "What is important to your father?", "What is important to your mother?"

As a result, we identified seven groups, which we named "lifestyle groups."

One example is the "ceremonial" lifestyle.

People in this category tend to be polite and distant in their interactions with others.

Start the day late and go to bed late

Classical music plays more prominently in this group than in other groups.

In terms of dietary trends, it's more French than traditional Dutch.

(Laughter) This group stands in contrast to the "craftsman" lifestyle.

"Artisans" have an old-fashioned lifestyle, early to bed and early to rise, because people in this group have been working with their hands for most of their lives. They often ran small family businesses, farmers, shops, or, like "Mr. B," they were farm workers.

I was told that every morning when he left for work, he would put his lunch and a cigar in a paper bag.

These cigars were said to be the only luxury he allowed himself.

It was his custom to smoke a cigar after lunch.

Until the day he died in Hogewick, every day after lunch he would come to this little hut to enjoy a cigar.

this is my mother

My mother's style is "cultured." This was her sixth week in Hogewick.

People in this group love to travel, they value meeting people and cultures, and they're interested in art and music.

there are other lifestyles

Anyway, this is the form of care that we've discussed and put into practice.

But living together with like-minded people is not the same as living your own life, your family life.

But that's not all. We all want life to be fun and meaningful.

Humans are social animals, so we need human interaction.

we have created such an environment

Everyone wants to go out, want to shop, wants to meet people.

I want to go to the pub I want to go out for a beer with my friends

And people like "Mr. W" love to go out and want to go out every day to find a nice woman.

(Laughter) He treats women with respect.

Then the two dance in the pub

every day is a festival

Some people would rather go out to a restaurant than a pub, where they drink wine with friends, have lunch or dinner, and enjoy life.

My mother takes a walk in the park She sits on a bench in the sun waiting for someone to sit next to her I want to talk about life with that person If you don't like that, you can talk about the ducks in the pond.

Such exchanges are important

Because it means that there is a proof that you are a member of society, that is, where you belong.

all humans need it

even those who suffer from advanced dementia

This is the view from my office

One day, I saw a woman walking from the other side, and another woman came from the other side, and they met at the corner.

I know both of them very well

I often saw both of them walking outside.

I sometimes try to converse with these two people, but conversing with either

it's quite difficult

But then I saw these two people meet and have a conversation, both gesticulating.

they were talking happily

Eventually, the two exchanged goodbyes and went their separate ways.

This is what humans want: meeting people and engaging with society.

The sight I saw is a good example

Hogewick has become such a city, a place where people with advanced dementia can live normal lives with the promise of freedom and security, and that's only because the professionals and volunteers who work here are accustomed to taking care of people with dementia.

Professionals know how to use their skills to fit naturally into people's lives.

To that end, it is the responsibility of the manager to create an environment in which the staff can do their jobs without any inconvenience.

It requires a drastic decision by management

It requires a completely different approach from the existing methods in traditional nursing homes.

We believe in its effectiveness

I think this care system can be applied anywhere, because it's not the prerogative of the wealthy.

We run on the same budget as traditional nursing homes in this country.

We are able to operate within the budget approved as national aid.

(Applause) And we've been able to do this because we've changed the way we think about our work, and we've looked at the person with dementia right in front of us and re-examined what they need right now.

What's important is to change the patient's smile, to change their mindset, and to change their behavior, and it doesn't cost anything.

And one more thing: making the right choices.

It's a choice of what to spend

I always say, "Red curtains cost the same as gray curtains."

(Laughter) It's possible wherever you are.

thank you

(applause)

What I want to share with you today is my personal take on how robots are encroaching on our lives on many different levels and timescales.

When I think about the future 500 years from now, I can only imagine a world where robots are everywhere.

Aside from the pessimistic predictions about the fate of humanity, if we exist in this world, there must be many robots.

The question is, will the robots that will exist like this in 500 years be ubiquitous before then?

50 years from now it will already be

I think it's quite possible that robots are everywhere.

In fact, I think it will happen sooner than later.

You could say that we're at the dawn of the rise of robots.

Computers first came through games and toys.

Perhaps the first thing that came to our homes was a computer that could play "Pong," a tiny microprocessor built into it, and other games followed.

The same thing is happening with robots. Who has a LEGO Mindstorms or a Furby Furby?

38 million sold worldwide

It was quite popular, and this was a simple robot with a few very small sensors that could do a little bit of information processing and movement.

On the right is another puppet robot that was sold a few years ago.

They sell all sorts of hacking kits and books, just like in the early days of computer geeks when they were tinkering with computers.

On the left is a platform from Evolution Robotics, where you can put a PC on it, program it with a GUI, and let it wander around your house and do all sorts of things.

And then there's the more expensive robot toy, Sony's Aibo, and the one on the right is NEC's PaPeRo, but I don't think it's going to be released.

But these things exist

In the last few years, we've also had robot lawn mowers, the bottom one from Husqvarna, the top one from Israeli company Friendly Robotics.

And over the last year or so, I've started seeing a lot of home cleaning robots.

On the top left is a very nice home cleaning robot, made by Dyson in the UK, but it's very expensive, $3,500, but it never made it to market.

But the Electrolux one on the bottom left is for sale.

There's another one from Karcher

On the bottom right is one that I made in my lab about 10 years ago, and it was recently commercialized.

let me show you this

Chris says he'll give this to someone later.

This is a robot that you can buy that cleans your floor.

Move while drawing a circle gradually

When you hit something... did you see it?

It's moving along the wall and along my feet It's cleaning the surroundings So here... Huh? did someone steal my cereal? My serial has been stolen!

(Laughter) Don't worry, it's okay. Robots are smart!

(Laughter) Three-year-olds don't worry.

Only adults get upset

(Laughter) Okay, let's put some "garbage" here.

(laughs) yes

(Laughter) It's hard to see, but I put a lot of cereal in here.

Yes, it's fine. Then... Let's put this aside

(Applause) The hard part was designing a good cleaning mechanism. The brain inside is pretty simple.

By and large this is the same for other robots

In a way, we tend to be computer supremacists, thinking that computing is everything, but the mechanical part is also important.

This is another robot called PacBot, which I've been building for years.

It's a military reconnaissance robot that goes ahead of the soldiers, scouting caves, for example.

We had to make it pretty rugged, much sturdier than the robots we usually build in the lab.

(Laughter) The robot's brain is a PC with Linux.

It can withstand 400 G's of shock, and the robot itself has intelligence and can flip itself, move into range, climb stairs on its own, and more.

Here we are doing on-site navigation.

When the soldier gives the command to climb the stairs, he obeys.

It wasn't an intentional fall, but...

(Laughter) I'll avoid it this time.

The big turning point for these robots was the 9/11 attacks.

I sent you to the World Trade Center late that night.

You couldn't do much with the pile of rubble in the center.

But we were able to go into all the surrounding buildings that had been evacuated, and search for survivors in buildings that were too dangerous to enter.

Watch this video

Friends on the battlefield help reduce combat risks

Reported by Nick Robertson

Rodney: Can I have another one of these?

thank you

This is a corporal who saw a robot for the first time two weeks ago.

We're sending robots into the cave to check on the situation.

The robot moves fully autonomously

In the past, the worst thing that happened in the cave was when one of the robots fell 10 meters.

It's been a year since the US military started using robots like this.

Now in Afghanistan, working every day.

That's one of the reasons we're told there's a robot invasion.

The future of technology is changing

thank you

In the next few months, we'll be sending robots out into the oil fields to do underground production to extract the years' worth of oil left in the ground.

150℃ and 10,000psi pressure is a very harsh environment.

Autonomous robots burrow underground to perform this type of work.

But controlling a robot like this is a bit more difficult.

The challenge will be how to program the robots in the future to make them easier to use.

Now let's take a look at the robot in action, a robot named Chris. Stand up, okay.

Come over here, you're a robot, so you seem to think you have to be formal.

It looks like that, but here... it's just because I'm British.

(Laughter) (Applause) I'm going to show this robot a task, a very complicated task.

You nodded. You're telling me something here. I know you understand the flow of communication.

If I had said something out of the ordinary, you would have frowned and adjusted the conversation.

I'm going to hold this up in front of him here.

Look him in the eye to make sure you saw the bottle head.

And here we do the task and he sees it

He's alternating between my eyes and what I'm looking at, so he's sharing attention.

I'm going to put a task on it, and it's looking at me, and it's looking at me, trying to figure out what's going to happen next.

(Laughter) OK You're good Yes you're good You're good

i won't tell you that

Let's see if we can put it back together

(Laughter) Robots seem to think that they move slowly.

Nice robot, well done

Now I understand a lot

In interactive interactions, when you show how to do something, you attract the other person's gaze.

The other person communicates their situation, whether they understand or not, and adjusts the dialogue.

I also found that by looking at the same thing, they shared their attention and finally recognized that they were rewarded for their interaction.

We're currently trying to incorporate this into our lab robots, and I think this is the preferred way to interact with robots in the future.

I'm going to show you a technical diagram here.

The most important part of creating a robot that can interact is a visual reminder system.

Because what we pay attention to is what we see and relate to, what we understand the behavior of the robot.

In the video I'm going to show you now, you'll see the robot's visual reminder system, which looks for skin tones in the HSV color space, so it's compatible with all racial colors.

Finding bright colors in toys

look for something that moves

Compare them in your field of view, find the spot with the highest score, and quickly move your eyes to where the most interesting event is happening.

keep an eye on it

At the same time, from the top down, you decide to look for a skin color because you're lonely, or you decide to look for a toy to play with because you're bored.

Weight changes

And this right side, which we call Steven Spielberg's Memorial Module...

Have you seen the movie "AI"? (Audience: Yes) It was a terrible movie, especially when a little robot played by Haley Joel Osment stared at the Blue Fairy for 2,000 years without looking away.

This is the answer that addresses it, because it's Gaussian habituation that works negatively, and if you keep looking at one thing,

As a result, they get bored and start looking at something else.

That was a very short explanation, but this is Kismet the robot. I'm looking for a toy. You know what I'm looking at?

The eyeballs covering the camera can tell you where you're looking, and you can see how it finds toys.

You showed a little emotional reaction

(Laughter) But the attention continues, if something more interesting comes into view, like Cynthia Brizeal, the creator of this robot on the right.

When I notice it, I pay attention to it

Kismet has an internal three-dimensional emotional space, which is a vector space that indicates the location of emotions.

Express where you are in that space Can you make a sound?

Can you hear me? (Audience: Yes) Do you really think so? do you really think so?

do you really think so?

You express your emotions through facial expressions and tone of voice.

Here, when I was interacting with the robot, just like Chris the robot was measuring my tone of voice, I tried to measure four basic messages expressed by tone of voice, which are what mothers tell their children before they speak.

Here, a subject with no prior knowledge is praising the robot, nice robot.

cute little robot

(Laughter) And the robot is responding appropriately.

Well done Kismet

(laughs) look at my smile

It makes you smile. You imitate a smile. This happens a lot.

These are subjects without prior information

I asked you to get the robot's attention and let me know when the robot gets distracted.

Kismet yes yes

She knew she got the robot's attention.

do you like toys?

Now, here I asked you to blame the robot. This first woman really drives the robot emotionally.

no no no no

(laughs) No no no no

(Laughter) Let's keep it that way.

Combining these, we added order alternation

when you talk to someone, talk first

Then raise your eyebrows or move your eyes to let the other person know it's your turn to talk.

Then the other person talks, and then they take turns talking.

I built this into my robot

We took a group of naive subjects, didn't teach them anything about the robot, and had them sit in front of the robot and have a conversation with them.

What they don't know is that robots don't really understand any language, and they don't speak English.

Just speak random English phonemes

I want you to take a good look at the beginning of this, and this guy, Richie, had a 25-minute conversation with the robot. (Laughter) "I have something to show you.

I want to show you this clock

He brings the clock to the center of the robot's field of vision, points to it, moves it, and successfully shows the clock to the robot.

I don't know if you've noticed, but the robots also take turns.

"I have something to show you. This is a watch my girlfriend gave me."

"Oh, good"

"Yeah, look, there's also a blue light inside. I almost lost it last week."

(Laughter) I follow his eyes and make eye contact with him.

"Can you imitate?" "Yes, of course."

In this way, communication was successful.

I'll show you another thing that Chris and I did.

This is another robot called "Cog"

First we make eye contact, then when Christie looks at the toy, the robot guesses her gaze and sees what she sees.

(Laughter) I think we're going to see a lot more research into these types of robots.

And that's where the big questions come in. The two big questions I'm asked are, if these robots get even more human, will we be able to accept them? Will they need rights in the future?

Another question I get asked a lot is, are robots going to replace humans?

(Laughter) The first question is a common theme in Hollywood movies. These characters are familiar, but in each case the robots want dignity.

Should robots be given rights?

It's just a machine

But if you think about it, we're machines too.

In the eyes of a molecular scientist, it does.

There's no explanation, for example, that a molecule called "A" comes along and bonds with another molecule.

Various forces are working and moving forward, the soul comes there, and the molecules are properly connected.

It's all mechanical We are machines

If we were machines, at least in principle, we should be able to make machines out of other things to make things that live like us.

But to admit it, we have to give up on ourselves as being special.

We've retreated from this particularity in the past, at least many times over the last few hundred years, under attack by science and technology.

500 years ago, we had to abandon the idea that we were the center of the universe, when the earth began to orbit the center of the sun.

And I can imagine... it's always tough

In recent years, I've also been confronted with the idea that maybe we weren't born on Earth, and we all hate that, and when people tell us that we only have 3,500 genes, it doesn't make sense, and it feels like there should be more.

And because we don't want to give up on human specialness in this way, the possibility that robots could really have feelings, or even be thought of as living beings, would be unacceptable.

But in the last 50 years or so, we'll come to accept this.

The next question is, will machines replace us?

The general scenario is that we create them, they grow up, we nurture them, they learn a lot from us, and eventually come to judge us as slow and boring.

They want to replace us.

If you've got a teenager, you'll understand.

(Laughter) Hollywood extends this emotion to robots.

But the question here is, who would go wrong and build a robot that would take over a human?

I was messing around in the garden alone, like, "I made a 747 by mistake!"

it won't happen

And... (Laughter) I don't think you're going to build a robot that's intentionally dangerous.

Before the super bad robots came along

Somehow a bad robot should appear, and before that there should be a not-so-bad robot.

(Laughter) So there's no reason to leave this alone.

(Laughter) So the bottom line is that robots are coming. But don't worry, it's going to be fun.

(applause)

On August 28, 1963, Dr. King delivered his "I have a dream" speech at the March on Washington for Jobs and Freedom.

Nearly 250,000 people gathered on the National Mall that day to demand an end to the discrimination, segregation, violence and economic exclusion faced by black Americans.

None of this would have happened without the organizer of the march, a man named Bayard Rustin.

Rustin was raised Quaker and began peaceful protest against segregation in high school.

A lifelong pacifist, he was imprisoned in 1944 for conscientious objection to World War II.

During his two years in prison, he protested from inside the quarantine facility.

Rustin organized and championed methods, groups, and people everywhere that spread the message of equality, and he always ordained himself to these.

He joined the Communist Party because one of its priorities was the civil rights of black people in America, but he soon left after becoming disappointed with the party's authoritarian stance.

In 1948, I went to India to study the strategies of Gandhi's peaceful protests, who had just been assassinated.

He returned home with a strategy of peaceful protest that included civil disobedience.

He partnered with Dr. King in 1955 to share these ideas.

As Martin Luther King's fame grew, Rustin became his chief advisor and strategy strategist for the great civil rights movement.

He put his organizational skills to good use in the 1956 bus boycott in Montgomery, Alabama, when he actually organized and carried out the transit protests that pioneered this boycott a decade earlier.

His biggest project began in 1963, when he led plans for a national march in Washington, D.C.

But there were serious concerns that the riots would injure participants and undermine the peaceful protest message.

Rustin not only coordinated with local police and hospitals, but also organized and trained 2,000 volunteer security leaders.

Despite this impressive performance, some of the organizers were reluctant to lead the march with other leaders from the South because of his homosexuality.

Despite these insults, Rustin kept his focus, addressing the demands of the protesters in a speech to President Kennedy on the day of the march.

The march went smoothly without any disturbances.

This is credited with helping to pass the Civil Rights Act of 1964, which prohibited racial segregation and employment discrimination in public places, and the Voting Rights Act of 1965, which prohibited discriminatory treatment in voting.

In spite of his many years of service, certain political issues displeased his peers.

Some thought his stance on the Vietnam War was lukewarm, others said he was too friendly to the political establishment, including the president and Congress.

Some were uneasy about having been in the Communist Party before.

But he also joined the government and joined the Communist Party because he was driven by a desire to maximize black American freedom in a concrete way, and to do it as quickly as possible.

Rustin didn't get any major assignments in the 1960s and '70s, but he never stopped working.

He came out as gay in the 1980s and worked to raise awareness of the AIDS crisis until his death in 1987.

In 2013, 50 years after the March on Washington, President Barack Obama posthumously awarded Rustin the Presidential Medal of Freedom, calling him "a march for true equality, regardless of race, regardless of who you love."

I was here about four years ago to talk about the relationship between design and well-being.

At the end of the talk, I showed you a list under the title "What I've Learned in My Life So Far"

Since then, I've learned very little to add.

This is an inflatable monkey that we've done in every town in Scotland. "Everyone thinks they're right all the time."

Each one of these has been combined and introduced on the media

Drugs are fun in the beginning, but later they become a drag

we are also changing the media

This is a projection that allows you to see the viewer as they pass by.

The viewer inevitably breaks the spider web when passing through it.

These are all graphic design works

. we create these for our clients

made to order

I will never have the money to pay for these installations and all the billboards and production costs, so they all have clients.

These are the 65,000 hangers on the boutique street

worrying solves nothing

"Money doesn't make me happy" was originally supposed to appear on a two-page spread in a magazine.

However, the printer lost the file and didn't tell us about it.

And when I picked up the published magazine, it was 12 pages in a row.

money makes me really happy

And a friend of mine from Austria, who was so sorry about that, got the owner of the biggest casino in Linz to let us wrap his building.

So here is the big pedestrian zone in Linz

There it says 'money' And in a side street it says 'It doesn't make me happy'

We also did a kind of show last week in New York.

We blasted the window with steam all the time, and every hour we had different designers come over and write what they learned on the window steam.

Everyone participated. --Milton Glazer, Massimo Vinielli, etc.

Singapore is really controversial

This is a small spot that we filmed that was to be projected onto a big jumbotron in Singapore.

And, of course, it's nostalgic to me, because these feelings, some mundane and some profound, originally came out of my diary.

I often go back and read my diary to see if I want to change anything about my current situation.

It's been long enough, so I'll check to see if I'm actually doing something about it.

Well, the last thing I'm going to show you is an ad

It's the roof of a building in New York. It's the roof of a studio.

This is newsprint paper and a template placed on it.

left it in the sun

As we all know, newsprint can turn pretty yellow in the sun.

After a week, the stencils and leaves were removed, and the paper was transported to sunny Lisbon.

After three days it started to fade and after a week there was no more complaints

(laughs) Thank you for your attention.

(applause)

Let me start by asking a scary question: Are we headed for a future without jobs?

There's been an explosion of interest in this question as we've seen significant advances in technologies like self-driving cars.

The fear that automation will wipe out the workforce and create mass unemployment can be conservatively traced back to the Luddite movement in England 200 years ago.

Since then, this fear has surfaced again and again.

You probably don't know about the Triple Revolution report, which was actually an excellent report.

It was written by some very bright people, including two Nobel laureates, and reported to the President of the United States, warning that the country was on the brink of economic and social upheaval as automation would put millions of Americans out of work.

Well, that report was delivered to President Lyndon Johnson in March 1964.

That was over 50 years ago, and of course that never happened.

This kind of story was repeated many times

Alarm bells were rung many times, but they were always false alarms.

And it's always been a false alarm, which has led to a typical way of thinking about situations like this.

The gist of it is that technology may destroy entire industries.

may wipe out some professions and industries

But of course, at the same time, technological progress leads to new things.

In the future, new industries will appear and it will be necessary to employ new people.

New kinds of jobs are emerging and they are still unimaginable.

That's the story so far, it's been a positive story.

Indeed, the new jobs that have arisen are often better than the jobs that existed before.

For example, in a job where you can devote yourself more

It was a safer, more comfortable job, a better paying one.

That's why it's positive

that's how it unfolded

But for one particular class of workers, a very different story awaited.

For these workers, technology has completely destroyed their jobs and created no new opportunities.

These workers are, yes, horses.

(Laughter) So I'm going to ask you a challenging question: Is it possible that at some point in the future, a large portion of the human labor force will be as redundant as the horses?

You might instinctively and intuitively answer,

"That's ridiculous

You can't compare a human with a horse."

Of course, horses are limited, so when cars and trucks and tractors came along, horses were helpless.

Humans, on the other hand, have intelligence, and we can learn new things and adapt.

So, in theory, we should always be able to find new things to do and stay involved in the economy of the future.

But here's what you need to understand

The machines that threaten our workers in the future are nothing like the cars, trucks and tractors that put horses out of work.

Eventually, many machines will be able to think, learn and adapt.

And so, technology finally begins to threaten our fundamental human capacity, the key capacity that separates us from horses, and it's the very capacity that has allowed us to stay one step ahead of progress, to remain relevant to the economy, and indeed to be integral to the economy.

So what makes today's information and communications technology so different from anything we've seen before?

I will address three fundamental points

The first point is that we've seen a continual exponential acceleration.

Moore's Law, as you probably know, is a much broader phenomenon than that, and it applies to a lot of things, like software and bandwidth in communications.

But the key point is that this acceleration has been going on for a long time.

In fact, it's been going on for decades now.

Since the first integrated circuit was manufactured in the late 1950s, there have been 30 doublings of computing power.

That's a tremendous rate of growth for any amount, and that means we're going to see a tremendous amount of staggering progress going forward, and of course it's going to continue to accelerate from this point on.

So in the years and decades to come, we're going to see things that we can't even imagine right now.

that would be mind-boggling

The second point is that machines are beginning to think, albeit in a limited sense.

I'm not talking about human-level AI or science fiction-like artificial intelligence, I'm simply talking about machines and algorithms making decisions.

I'm working on problem solving, and more importantly, I'm learning.

In fact, if there's one major technology around this that's driving this, it's machine learning, and it's becoming an incredibly powerful, disruptive, and scalable technology.

The best example I've seen recently is what Google's DeepMind division did with their Go program, AlphaGo.

This is the system that defeated the world's best player in a game of Go.

At least from my point of view, Go has two distinct elements.

The first is that the number of possible moves in Go is very large and essentially infinite.

There are actually more possible moves than there are atoms in the universe.

What this means is that you can't build a computer that can win Go by throwing in the kind of brute force computational power that we used in chess.

So we need sophisticated methods, like thought processes.

The second thing that stands out about Go is that when I talk to Go players who participate in title matches, they don't always articulate their thought processes during the match.

It's often intuitive, and it's mostly intuitive about which move to take.

Given these two characteristics, it's tempting to say that playing Go at the world championship level is a far cry from automation.

Because we tend to draw hard lines, and on one side of the line are those tasks and tasks that are essentially considered regular, repetitive, and predictable.

These jobs may be in different industries, different job types, different skill levels, but they're inherently predictable, which makes us think that they'll eventually be automated and replaced by machine learning, and I'm pretty sure that's the case for many jobs.

That's probably the case for about half the jobs in the economy.

But if we look at the other end of the line here, there are all kinds of jobs that require abilities that we think only humans have, and we think these jobs are safe.

Now, based on my knowledge of Go, I might think that Go should be the safer side of the line.

But the facts are different, and Google is solving the problem, and this boundary is very dynamic.

Its position will shift, and it will swallow up more and more of the occupations and tasks that we currently think are untouched by automation.

The other important point is that this trend isn't just about low-wage jobs, manual labor, the jobs and jobs that people with less education are doing.

A lot of evidence shows that the skills that technology is acquiring are improving rapidly.

We're already seeing the impact on the professions, and tasks like these have traditionally been done by accountants, financial analysts, reporters, lawyers, radiologists, and so on.

So the prospects for what jobs, jobs, and jobs will be threatened by automation in the future will have to be reconsidered.

Combined with these trends, our future might look something like this: Significant unemployment.

Or at least face massive underemployment, stagnating wages, and even a downward trend in wages.

And of course social inequality soared

All of this puts a tremendous burden on social organization.

And then there's the underlying economic problem, because in our economy today, jobs are the primary mechanism that distributes income and thus purchasing power, and consumers buy the products and services that are produced.

To sustain a vibrant market economy, we need a system in which a very large number of consumers can purchase the goods and services produced.

Without it, we could be on the verge of a recession, or a vicious cycle of economic downturn, because there aren't enough consumers to buy the products and services that are produced.

The important thing to understand is that all of us as individuals rely on access to the market economy for our success.

If you think about one extraordinary person, you can imagine it concretely.

Take Steve Jobs, for example, and let him land on a remote island alone.

On that remote island, he'll be running around picking coconuts like everyone else.

He can't do anything special, because of course there's no market for his incredible talent.

This is why access to the market economy is important for the individual, and important for sustaining the system as a whole.

So the next question is, how do we solve this problem?

Think of this from an utopian perspective

In a future society where everyone doesn't have to work so much, there will be more time for leisure and entertainment, more time to spend with family, and more time to do things that are truly worthwhile.

It's a great future

we should strive for it

But at the same time, we have to be realistic, and we have to recognize that we're going to face a serious problem of income distribution.

many people will be left behind

Ultimately, to solve that problem, we have to find a way to separate our income from our traditional jobs.

And as far as I know, the best and the easiest way to do that is income security, or guaranteed minimum income.

A guaranteed minimum income is becoming an important idea.

It's starting to gain attention and acceptance, and there are a lot of pilot programs running, experiments around the world.

In my view, minimum income security is not a panacea.

It's an idea that we should build on and improve upon.

For example, one of the things I've written about quite often is that the minimum income guarantee should have a clear incentive system.

I'll give you an example, let's say you're a struggling high school student.

Let's say you're on the brink of dropping out right now.

But what if, no matter what, one day in the future, we would all have the same guaranteed minimum income as everyone else?

I think the system creates an inappropriate incentive to simply give up and drop out.

That's why I'm against that mechanism.

Instead, let high school graduates earn more than dropouts.

The idea of ​​incorporating incentives into minimum income security could probably be extended to other areas.

For example, you could have a reward system for helping people with community services or helping to protect the environment.

So by incorporating incentives into the guaranteed minimum income like this, we can improve that, or take a few steps towards solving other problems that we may face, such as how we will find meaning and fulfillment in our lives in a future when the demand for traditional jobs is diminishing, how we will spend our time.

Developing and refining the guaranteed minimum income would make it better, and perhaps more politically and socially acceptable and viable, and of course that would increase the odds that the system would actually be put into practice.

I think the most fundamental, almost intuitive objection that many of us have to the idea of ​​a guaranteed minimum income, or to any form of expansion of Social Security, is the concern that over time there will be too many people riding the economy for free and the economy will lack traction.

But here's the point of this story: In the future society, machines will have the ability to take over from us and drive the economy.

It will give us even more options in how we build our societies and economies, and eventually it will become more than options, it will become essential.

The reason, of course, is that all of this puts a lot of pressure on our societies, and it's the way work is the way that we allocate purchasing power to consumers and keep the economy going.

If in the future that mechanism were to be compromised, we would have to replace it with something else, or the whole system would be in danger of becoming unsustainable.

But what I really think is the point of this story is that finding ways to solve these problems and build the economy of the future so that everyone can succeed at every level of society is going to be a very important challenge that we all face in the years and decades to come.

thank you

(applause)

When you take a walk around your house, you usually feel safe and comfortable.

Now imagine that there are landmines buried in those familiar places, and they're all over the place, and you never know when you might step on them.

In my home country of Colombia, there are many such areas.

After 50 years of civil war, literally countless landmines have been planted all over the countryside, affecting more than one in three Colombians.

These anti-personnel mines are designed to inflict serious injury rather than kill.

The logic behind the action is really cruel, because if you injure a soldier more seriously than just kill him, you'll need more manpower to care for the wounded, and the enemy's loss of strength will be greater.

I met Adriana Rodriguez five years ago when she was commissioned by the Colombian government to make a film, and I was a documentary director.

In the midst of ongoing conflict, she was forced to

I left home with my baby

One day, her neighbor died because she stepped on a landmine.

It wasn't outdoors, but when he entered an empty house, a house very similar to the one Adriana lived in.

Ever since then, she's been terrified that she or her children will step on landmines.

In Colombia, the civil war has lasted so long that neither my mother nor I have ever seen anyone living in peace in this country. And for someone like me, someone who's just trying to get away with it, there are only two options left.

I hate to admit it, but I spent nearly 30 years getting used to the status quo.

But meeting my wife changed me.

My wife, a political sociologist, was very passionate about studying the armed conflict in Colombia.

She explained things so carefully that I could understand that my country, Colombia, has been deeply scarred by civil wars and land mines.

So we decided to go to the United States to learn new skills that could be useful in Colombian society -- skills that could help rebuild society.

While I was in graduate school, I started a new development, which is expected to have widespread application in augmented reality, or AR, to assist soldiers in clearing mines.

As I was working on this development, I realized that Colombia wasn't the only country in the world still struggling with mine clearance.

In fact, more than 58 countries have land at risk because some form of explosive has not been removed from the ground.

In 2015 alone, the escalating conflict has almost doubled the number of landmine casualties in countries like Libya, Syria, Ukraine and Yemen, from 3,695 to 6,461.

Please try to imagine

Some countries are focusing on clearing landmines, while others are continuing to install and expand them.

What happens after a conflict that uses mines ends?

There are two

The first is that people who have been evacuated to faraway towns across the country will return to their homes. The second is that we will see more cases of untreated landmines exploding in urban areas.

So I decided to stay in the computer science department at New York University, and I started working with Professor Claudio Silva on an app called MineSafe.

MineSafe is an app that shows the routes that people use the most and that are free from accidental landmine accidents, based on local information.

It also helps identify areas of high urgency for demining by showing patterns of traffic routes.

About 15 million Colombians live outside the big cities.

Imagine, if we could crowdsource and analyze the information about these areas, people who were terrified to leave their homes, like Adriana and her children of old, would be able to walk on safe roads with peace of mind.

Collected information can be used in other situations

because it can be applied to more productive activities.

Farmers will be able to find safe land once the explosives have been cleared, helping them find fertile new land to resume food production.

MineSafe is partnering with the Colombian government on a pilot project to test and operate, while also contacting stakeholders in Cambodia and Somalia.

The project has also received financial support from American civilians, and we're not going to stop here.

We want to expand our reach, and we want to expand this project to every corner of the world, where landmines are a threat.

The armed conflict in Colombia has finally come to an end, but the landmines left behind by years of conflict still lie beneath our feet.

We use MineSafe to restore peace to our people and restore security to our homeland.

thank you

(applause)

You can fit every movie ever made in this tube.

If you can't see it, that's the point

(Laughter) Before we can understand how this is possible, it's important to understand what it's worth.

Today, in the form of photographs, videos, and other forms of digital data, our thoughts, our actions, and even the details of the exercises we perform, are stored digitally.

Aside from using up your phone's storage space, you rarely care about the size of your digital data.

Humanity has generated more data in the last few years alone than in all previous eras combined.

big data is now a big problem

Digital storage is expensive, and there's no such thing as a truly time-tested device.

There's a non-profit website called the Internet Archive.

Not only are books and movies offered for free, but old web pages date back to 1996.

It's very fascinating, but I decided to take a look at the humble TED website when it was new.

As you can see, a lot has changed in 30 years.

And then I saw the first TED in 1984, and it just so happened to be about a Sony executive explaining how compact discs work.

(Laughter) It's really cool to be able to go back in time and see that moment.

And it's interesting that 30 years after the first TED, we're still talking about digital memory.

Thirty years earlier, in 1956, IBM released the first hard drive.

This is in the process of being loaded for shipment.

It had a capacity of about one MP3 file and weighed more than a ton.

At $10,000 per megabyte, I don't think anyone here would buy it, though they might want it as an antique.

It was cutting edge at the time.

much has been done since

Storage has evolved dramatically

But all storage media eventually get old and obsolete.

If you were handed a floppy to copy the presentation files to, oddly enough, you would laugh, but you wouldn't be able to actually use it.

It no longer fits my data storage needs, although it might work for coasters.

Any technology will eventually be lost along with our data and memories.

There's an illusion that the storage problem has been solved, but we've just let the problem out.

emails and photos in the cloud

No need to worry about where to save

But behind the scenes, there's still the storage problem.

Even the cloud is just a bunch of hard drives.

A lot of digital data probably isn't that important.

You can also simply delete

But do we really know at this point which ones are important?

We've learned a lot about human history from cave paintings and stone tablets.

I deciphered the language from the Rosetta Stone.

You'll never know everything

Data tells our story, and even more so today.

We no longer record on lithographs.

I don't have to decide now what's important.

Because there's a way to store all the data

The answer has been there for billions of years, in this tube.

DNA is nature's oldest memory device.

It holds all the information necessary to create and sustain humans.

But what's so great about DNA?

Let's take our genome as an example.

Three billion A's, T's, C's, G's, printed in a normal font, in a normal format, and stacked up, would be 130 meters tall, halfway between the Statue of Liberty and the Washington Monument.

If you convert this A, T, C, G into digital data of 0 and 1, it will be several gigabytes.

It's inside each cell of our body.

we have over 30 trillion cells

You see, DNA can hold a huge amount of information in a very small space.

DNA is highly durable and does not require electricity to store data.

We know this because scientists have actually reconstructed human DNA from hundreds of thousands of years ago.

One such example is "Iceman".

i know he was austrian

(Laughter) It was found in a well-preserved mountainous area on the Italian-Austrian border, and we also know that a genetically similar human is still alive in Austria.

Maybe some of you have iceman cousins.

(Laughter) So that means we're more likely to be able to extract information from ancient humans than from old phones.

And the chances of losing the means to read the DNA are lower than with any man-made device.

New storage methods require new means of reading

DNA will always be readable

If the DNA becomes unreadable, we have a much bigger problem than storing the data.

Storing data in DNA is nothing new.

It's been happening in nature for billions of years.

In fact, you could say that all living things are DNA memory devices.

But how can we store data in DNA?

This is "Photo 51"

This is the first photo of DNA taken about 60 years ago.

Around the same time that IBM released its first hard drive.

Digital storage and our understanding of DNA have advanced together.

First, we knew how to read DNA, and soon after, we knew how to write it, how to synthesize it.

This is similar to how we learn new languages.

We can now read, write, and copy DNA.

It's something that happens all the time in the lab.

Anything that can be stored digitally can be stored in DNA.

To store something like this picture as digital data, convert it to bits.

Each pixel in a black and white photo is either 0 or 1

Writing DNA is like printing letters with an inkjet printer.

Basically, you convert digital data 0's and 1's into A's, T's, C's and G's, and the company that synthesizes DNA takes care of the rest.

That's how you can store data in DNA, and when you want to retrieve the data, you can decode the DNA.

Now, the fun part is deciding what files to include.

As a serious scientist, I wanted to include a paper that would benefit posterity.

And then a $50 Amazon gift card -- I mean, code from a used one -- and the operating system and the first movie and the Pioneer spacecraft platter --

Some of you may have seen

It depicts a typical male and female figure and the Earth's position in the solar system, prepared for the Pioneer's encounter with extraterrestrial life.

Once you've decided what kind of file you want to put in, you put the data together, convert the 0's and 1's to A's, T's, C's and G's and send it to the DNA synthesis company.

and it returns something like this

our files are in this tube

If you decipher the DNA, you can read it out.

It sounds simple, but there's a challenge to overcome between a cool, fun idea and something that actually works.

DNA is stronger than man-made devices, but it's not perfect.

Weaknesses

You read the data by decoding the DNA, but every time you read the data, the DNA is lost.

That's what happens during the deciphering process.

Losing data sucks, but fortunately there are ways to copy DNA, and it's easier and cheaper than synthesizing it.

We actually made 200 trillion copies, and we got all the data out without error.

Errors can also be introduced during the decoding process.

Nature deals with this problem inside the cell.

Our data is stored in synthetic DNA in tubes, so we had to find a way to overcome this problem.

We decided to use an algorithm used for streaming video.

What you're doing with video streaming is basically restoring the original video file.

When we restore the original file, we do the DNA decoding.

What they're both doing is restoring enough 0's and 1's to restore the data.

Because of the encoding scheme we used, we were able to lump the data together and make billions of copies, so that every file could always be recovered.

This is the movie that we have recorded in our DNA.

It was one of the first movies made, and now it's the first movie to have more than 200 trillion copies made in its DNA.

Shortly after I published this study, I answered people's questions on Reddit.

This site is familiar to all otaku.

Many of the questions were thoughtful,

Some of them were even funny

For example, when will we have a real "thumb drive"?

DNA already stores all the information needed to create a human being.

It's very safe to store data in synthetic DNA.

Reading and writing DNA takes much longer than saving a file to your hard drive—for now.

So for the time being, it will be for long-term storage.

A lot of data is short-lived

It's hard to know what's important today and what's important for future generations.

But I don't have to judge it now.

UNESCO has a wonderful program called Memory of the World.

It is an activity to preserve historical materials that are valuable to humankind.

I'm open to suggestions for things to add to my collection, including the movie I showed you.

It's a great way to preserve our human heritage, but it doesn't have to be a choice.

Instead of asking the current generation of us what will be important in the future, we can store it all in our DNA.

Storage isn't just about capacity, it's also about how well you store and retrieve it.

How much data can be generated, how much data can be recovered, how much data can be stored - there's always a tension between those three.

Advances in how we write data require new ways to read it.

old media becomes unreadable

I don't see disk drives much anymore on laptops, floppies are out of the question.

That's not the case with DNA.

As long as there are humans, DNA will exist and it will never be unreadable.

It's human nature to keep records of the world around us.

That's how far digital storage has come in the 60 years since we first started understanding DNA.

We've made similar progress with DNA sequencing machines in half that time, but as long as we're around, DNA will never get old.

thank you

(applause)

We urgently need to reduce our carbon footprint to prevent dangerous climate change

I don't think there's any room for discussion about this, especially for everyone in this room.

But it's a bit arguable that it's not enough.

We will run out of carbon budgets in just a few years to keep temperature rise below 1.5 degrees Celsius, and we will run out of budgets for 2 degrees Celsius rise in about 20 years.

We need to not only reduce emissions very quickly, but also remove carbon dioxide from the atmosphere.

thank you

(Laughter) I'm in the business of evaluating the viability of various proposed technologies.

We could have plants take up carbon dioxide, which could be used to feed trees, or it could be transported deep into the soil, or into the sea, where it could be stored.

Large installations called artificial trees could also remove carbon dioxide from the atmosphere.

For these ideas to become a reality, we need to consider whether they can be applied at scale in a safe, economical, and socially acceptable way.

These ideas come with trade-offs.

Nothing is perfect, but there are many things that have potential.

None can be expected to be solved alone

There's no silver bullet, but in combination, they could potentially be effective in curbing climate change.

I'm working independently on an idea that uses natural gas to generate electricity, but also takes carbon dioxide out of the air.

How does it all work?

The Origen Power process feeds natural gas into fuel cells

About half of the chemical energy is turned into electricity and the rest into heat, which breaks down the limestone into lime and carbon dioxide.

You'll probably think I'm on my mind around here.

that produce carbon dioxide

But the point is, the carbon dioxide produced by both fuel cells and lime kilns is all pure, and that's really important, because it means that such carbon dioxide can be harnessed or stored deep underground at low cost.

The lime produced in the process can be used industrially, and in the process removes carbon dioxide from the atmosphere.

This is a process that reduces carbon dioxide as a whole.

will be removed from the atmosphere

Normally, for every kilowatt hour (kWh) of electricity generated from natural gas, about 400 grams of carbon dioxide is emitted into the atmosphere.

By this process, minus 600 grams.

Right now, a quarter of our carbon footprint comes from power generation.

If we replace all power generation with this method, we not only eliminate all emissions from power generation, but we also reduce emissions from other sectors, potentially reducing our overall carbon footprint by 60 percent.

Lime can also be added directly to seawater and used as a neutralizer against ocean acidification, one of the problems caused by atmospheric carbon dioxide.

In practice this is cost effective

Adding lime to seawater absorbs twice as much carbon dioxide as using it industrially.

But this is where it gets really complicated.

Neutralizing the oxidized oceans is a good thing, but we don't fully understand the environmental implications, so we need to evaluate whether this regimen is doing us any worse than the disease we're actually trying to treat.

We need to institute tiered governance for this safety-assessment experiment.

And on that scale, over the next few decades we'll have to remove trillions -- trillions -- trillions of tons of carbon dioxide from the atmosphere to avoid dangerous climate change.

It would cost a few percent of GDP, think of it as a defense budget, at the expense of a lot of industrial activity, and with detrimental side effects.

Do you think it is huge? Because the scale of the problems we face is enormous.

It's also ridiculously big

We can no longer avoid these pesky problems

Either way, there are risks, either the world that has been changed by climate change, or the world that has been changed by climate change and trying to deal with it.

Best if avoided, but we can no longer close our eyes and cover our ears and take it easy.

We should grow up and face the consequences of our actions.

(Applause) Will talking about solutions to climate change undermine efforts to reduce emissions?

This is a real issue, and we should emphasize that reducing emissions is the most important challenge, and we are uncertain whether our ideas will work.

I'm testing it, but I still have things to look into.

Can we fix climate change?

I don't know about it, but it won't heal without doing

we need ambition without arrogance

We need ambition to restore clean air and reduce carbon dioxide levels to levels that maintain a stable climate and healthy oceans.

This will be a huge undertaking

If we compare it to the construction of a cathedral,

Business starters may draw blueprints and build foundations, but they never build a spire to the top.

The descendants have the right to do that work.

None of us will see that day, but we should begin with the hope that future generations will complete it.

Do you want to change the world?

i don't think so

I don't want to change the world, I just want it to be the way it should be.

thank you

(Applause) (Chris Anderson) Thank you. Let me ask you a few questions.

Tell me about the idea of ​​throwing lime into the ocean.

At first glance, this seems like a very plausible solution to ocean acidification, because it absorbs more carbon dioxide.

I was told that this would require experimentation.

What would responsible experimentation look like?

(Tim Kruger) It's going to take a series of experiments, and it has to be done gradually, in very small steps.

For example, when it comes to clinical trials of new drugs, we don't suddenly do human trials.

start with a small experiment

So we're not going to start out in the ocean, but on the ground, in a special container that's in an isolated environment.

And when we're confident that it can be done safely, we move on to the next step.

otherwise it will not proceed

I'm going step by step

CA: But who's going to invest?

This will have some effect on the whole planet.

Is this the reason why this business is not moving forward?

CA: If it's a small scale experiment, it could be done in territorial waters, and we can expect public support.

Ultimately, if we're going to tackle ocean acidification on a global scale in this way, we're going to have to do it in the high seas, not in the territory of any country, and we'll have to do it internationally.

(Anderson) Both the territorial waters and the high seas are all connected.

the lime will flow

People would be outraged when they heard about the experiment on Earth.

How do you handle this?

CA: I think you touched on something very important.

It's a question of whether this is socially acceptable.

This plan may be unacceptable, but we should have the courage to try and see what we can do and be open about it.

And we need to be transparent and involve people.

to get people's consent in advance

Even if the answer is "No, I don't want you to do that" when you try to get it, you should accept it.

(Anderson) Thank you.

(Kruger) Thank you. (Applause)

In fact, I'd like to discuss with you today politics and religion. These are the two triggers for war, not just one, but two roots that cause war. And now war is on the verge of being avoidable.

Now let's think about politics by focusing on the political system of democracy.

In political terms, democracy is a technique for restraining and distributing sovereignty.

Sovereignty can be distributed in various ways

A famous one is tyranny, and anarchy is the dispersal of sovereignty, rather than the orderly distribution of it. And democracy is a set of techniques that first spreads sovereignty over as many people as possible, and then reassembles it into a handful of rulers, who are empowered to govern by the choices made by the people.

Now let's think about religion, and here it's Islam, but there's also a straightforward view that this religion is pushing us toward war.

It's a potentially controversial statement, so I'll add why I think this is true.

In a nutshell, the relationship is this: "No war without 9/11."

At the beginning of the Bush administration, when the current president, Bush, was still a candidate for president, he made it clear that he would not intervene on a large scale in world affairs.

In fact, it was going in the direction of keeping a distance from other countries.

So I also heard that they were going to withdraw from the Kyoto Protocol.

After 9/11, that theory was overturned.

And the president, along with his entourage, decided to carry out some kind of aggressive intervention in neighboring countries.

It all started in Afghanistan, and in Afghanistan, things went as smoothly and quickly as possible, through democratic techniques where resolutions were made -- mind you, not perfect, but through democratic techniques, the Bush administration is going to go to war again -- this time in Iraq.

The reason I started with "No 9/11, no war" is that we have to admit that Islam has been interpreted by some very small but extremely radical people as part of, or even the cause of, 9/11.

On top of that, bin Laden and his supporters are desperate to create a conflict between "democracy," or at least the "Muslim world," which they define as democracy for capitalists.

So what kind of technique is Islam as a conceptual device?

First, techniques for salvation are at the core of our beliefs.

It's meant to be a tool for understanding the world, and the idea that it will bring salvation to every single believer. And that's what I mean by Islamists -- I use the term only to mean those believers who have that idea -- and they follow the slogan that Islam is the only answer to socio-political, personal, and personal beliefs.

People who hold that view, many in the Muslim world, deny the actions of bin Laden, but approve the teachings of Islam.

Islam is the theory that the world will be better if individuals achieve certain desired goals.

Also, although the goals that Muslims aspire to in principle are peace, justice and equality, in their view, they are consistent with the traditional teachings of Muslims.

Now, I don't want to leave the wrong impression by identifying as a technique either the content or the phenomenon of democracy or Islam.

I don't want to treat either of them as indicative.

A good way to demonstrate this is to tell you the thought process of deciding what to put on the wall behind me when I give a talk.

I immediately ran into a conceptual problem: I couldn't paint a picture of democracy.

You can put out democratic slogans and symbols signs

You can put out the Houses of Parliament. I had the same problem when designing the cover of my forthcoming book. What would you put on the cover to represent democracy?

As for Islam?

You might list mosques and worshipers, but that's not a direct representation of Islam.

So there's a kind of concept that's hard to express easily.

With that in mind, it seems like it's going to be a difficult issue.

So, in principle, it's not strange for all the self-proclaimed Muslims in the world to have different interpretations of what Islam is all about, and the same is true in the case of democracy.

For example, if you take the word "hope," you can look it up in the dictionary, trace its etymology, and come to some agreement on its usage.

It's a concept that people really disagree with.

As a result of that disagreement, it's nearly impossible for someone to say, "My Islam is correct."

As you know, after 9/11, we had a wonderful experience when George W. Bush said, "Islam means 'peace.'"

George W. Bush said so

some might say it means something else

Some say it means "submission"

Some said it was "recognizing and acknowledging God's sovereignty."

The meaning of Islam is wide and varied.

The same is true, ostensibly, of democracy.

Some people say that democracy is built on the basis of elections.

Others say, "That's not enough. We need the basic liberties of free speech and equality."

You don't get answers to these issues like, "Okay, that's how I think about it. Here's what that concept means."

So if Islam and democracy are currently in the midst of a great war, what does that mean?

It may be captured in a variety of frameworks of interpretation.

One of those frameworks started a few days ago, and that's fear.

It's natural to be afraid when war approaches, because it's very likely that many people will die in armed conflict, and so many Muslims don't want war. Neither do American democracies want war. People all over the world do.

I think it's a perfectly normal reaction to me.

From here on out, what I'd like to suggest to you is that there will be a positive response to that.

The positive response begins by acknowledging that both Islam and democracy are techniques.

The good thing about being a technique is how to manipulate it.

It can also be manipulated in many ways to produce very positive results.

what do i think

There are Muslims around the world who take Islam seriously and deeply, as the foundation of their faith, their civilization, their deep beliefs, and their identity.

Those Muslims -- and the vast majority of Muslims -- are totally against what bin Laden is doing, really against it.

What's more, they overwhelmingly believe -- not all, but overwhelmingly -- because anyone can read Muslim writings, which can be found on the Internet in multiple languages ​​-- everyone can understand Muslim thinking. They say that the fundamental role of each country is to give freedom to choose its own sphere of life, economic activity, political beliefs and, of course, religion. Religion itself is governed by much of the Islamic world.

Many Muslims also say that what they still disagree with in the United States is that America has been on the side of dictators in the Muslim world for its own short-term interests.

It may have been a defensive strategic base that America should have taken during the Cold War.

It doesn't help to think

A major clash between the West and the East may have been expected there, or it may have been necessary as the main axis of democracy against communism.

We had to be friends with everyone because we needed an ally in our mutual denial.

But the Cold War was over, and there was a growing consensus among Muslims -- it's the same here in the United States.

This is also the view of activists and practitioners of Islam, such as the elected Muslim members of the democratic government in Turkey, who act practically rather than ideologically and promote their own religious values.

You might also say, "What is it that Saudi Muslims on TV say is absolutely incompatible with the so-called democratic ideas of political choice and basic freedoms and equality?"

I want to tell everyone here that technique is malleable.

I want to tell you that many -- indeed the majority of Muslims -- as far as I can tell, the core values ​​of Muslims in Saudi Arabia are, so to speak, the recognition of God's sovereignty and the fundamental equality of people before God. Islam itself is compatible with liberty and equality and political choice.

Many Muslims certainly say that

they insist on it wherever they are allowed

But the government is, of course, somewhat intimidated by it.

And I try to keep the claims largely contained.

For example, young activists in Egypt tried to create a political party called the Center Party, which advocated the compatibility of Islam and democracy.

They didn't get permission to form a political party.

In fact, they are even prevented from forming political parties because of the political system. Why?

because they must be very successful

In the Islamic world's most recent elections -- in Pakistan, Morocco and Turkey -- those who told voters that they were Islamic democrats, respectively, won a disproportionate number of votes within their own free will.

For example, in Morocco, they were third in the vote, but they were only able to stand for half of the seats.

If there were more seats available, I would have gotten more votes.

In the face of all this, let me give you a positive view: the Muslim world is going through a period of transition.

Even among devout Muslims, change is happening. Those who are highly traditional, and those who are unwilling to compromise Islamic values, believe that through the adaptability of democratic techniques and the adaptability and future possibilities of Islamic techniques, the two will come together.

What are the consequences?

What is Islamic democracy?

The first thing I can say is that it will not be exactly the same democracy that we are used to in America.

That might be a good thing, given the criticisms being made today, such as what can democracy produce in terms of regulation, for example.

I don't mean to say that there aren't any Muslims here.

It's also what transforms Islam.

And from the attempt to join forces to bring democracy and Islam together to come together, there is a real possibility that the cultures of Islam and democracy could actually coexist closely together, rather than in conflict.

I started with war because it's a topic I don't want to talk about. When I'm talking about today's topic, the deception that war is impossible doesn't work.

War is a significant risk to the model you're talking about, because as a result of war, many Muslims might conclude that America isn't the country they want to imitate in terms of political form.

And yet, on the other hand, it's possible that, in the heat of war, many Americans may say, feel, or think that Islam is the enemy -- that Islam must be the nemesis.

Yet the president's political strategy is to take it seriously that Islam is not the enemy, and yet when it comes to going to war, it's a natural feeling to see other countries as enemies.

And then there's this urge to generalize as much as possible in making sense of who the enemy is.

so there's a lot of risk

On the other hand, the positive outcomes that can be achieved after the end of a war should not be underestimated, especially by those who were initially skeptical about going to war.

Even those who are against war should realize that when war does happen, it can't be practically, morally or morally right after the war to say, "Let's just leave it alone. Do what you want. We're against war in the first place."

Things don't move like that

Face the situation in front of you and move forward.

To those skeptical of the war, I would say that it is especially important to acknowledge the possibility that after the war the US government and the Muslims could negotiate and create a truly democratic and Islamic model of government.

It's important that those who care about the issue -- in the practice of activists -- within the art of democracy, within the system, seek to reflect their actions, their choices, their statements, within the system.

It's a bright message, but it's a bright message that only goes to those who understand that everyone has a heavy duty.

I think we have the capacity to meet that obligation, but only if we take it seriously.

That effort will serve as the basis for a brighter outlook.

thank you

By 1973, Harvey Milk had already had many life experiences: a naval officer, a high school teacher, a minor actor and a wandering hippie.

He started a new life, this time opening a camera shop in San Francisco, but his eyes were already turning to other things.

From the Watergate hearings on the national news to teachers forced to rent out their belongings for schools that couldn't afford projectors, Harvey recognized the desperate need for political reform everywhere.

Milk strongly believed that close-knit neighborhoods were integral to the fabric of cities, and that government should solve the most real problems of communities.

From fixing potholes and installing stop signs to promoting a culture of mutual help and cooperation, Milk envisioned a more humane approach to local government.

Driven by this idea, he decided to run for the city's governing board to represent the district in which he lived, the heart of America's gay culture, Castro Street.

At the time, police violence, discrimination and media bias plagued the LGBT community, labeling Harvey and his supporters political mavericks.

But he refused to hide his sexuality claims.

He was convinced that homosexual rights could not be obtained as long as they were hidden.

Milk was determined to bring basic public services to every disenfranchised group in San Francisco, regardless of race, age or sexuality.

But despite his oratorical talent and good-natured demeanor, voters failed to share milk's radical ideals.

In 1973, he lost his first election to the Supervisory Board.

1975 Lost again

The next year, he ran for the California House of Representatives, but was unsuccessful.

Still, he continued to be a staunch supporter of his neighborhood, building relationships with bartenders, building guilds, and local Chinese grocery stores.

He became affectionately known as "Mayor of Castro Street," and in 1977, in his third run for the Supervisory Board, he finally won a seat, becoming one of the first openly gay public officials in American history.

Milk embarked on a public mission eager to make a long-term difference.

He quickly introduced a bill banning discrimination on the grounds of his sexuality, and he also started cleaning up the city.

But there were also those who opposed this direction.

At the time, homophobia was gaining national support, manifesting itself in California's Ordinance 6.

The ordinance, which attempted to make it illegal for gays to work in California's schools, turned out to be the biggest battle of Milk's public service career.

Proponents of Ordinance 6 attacked the LGBT community, accusing them of being inappropriate to work in an environment with students.

But Milk urged them not to hide in fear:

Let's announce it to our relatives, to our true friends

Announce to your neighbors, to your colleagues, to destroy the superstition

Let's break the lies and farce

For you, and for them.” He joined other activists in his vehemently campaigning against hate.

November 7, 1978 Ordinance 6 was defeated by overwhelming opposition.

It was evidence that Milk's message was beginning to gain traction.

But just 20 days after this electrifying victory, he was assassinated at City Hall, along with the mayor of San Francisco, George Masconi.

Dan White, who murdered them, was a former member of the Supervisory Board and was on the opposite side of what he called "radicals, deviants, irredeemables."

Thousands of people lit candles and marched through the streets the night Milk was murdered.

And this tragedy was followed by new injustices.

In a highly controversial verdict, White received a mere seven years and eight months in prison. The verdict set off a city-wide uproar in what became known as the "White Knight Riot."

Even in death, Milk continued to preach hopeful claims.

He left a total of three tapes to his friends and supporters to play if he was assassinated.

These tapes included a call to action and the advice that everyone is welcome to join in fighting injustice. "I want this movement to continue, and if a bullet reaches my brain, that bullet will bring all homosexuals out into the open."

A few years ago, one thing always happened to me, especially at family gatherings like tea parties with my aunts and uncles.

People would come up to me and say, "Hey, what are you doing?"

Then I uttered the magic word that everyone loved, "Medicine!

I'm going to be a doctor

It's really easy.

It sounds simple, but it actually works for only about 30 seconds.

What are you going to specialize in? ”

And I said, quite honestly, "Yes, I'm fascinated by the large intestine.

It all started with the anus, but now I'm basically obsessed with the whole bowel."

(Laughter) At that point, everyone's enthusiasm faded away, and there was probably an awkward silence in the room that made me feel terribly sad, because I truly believe that the gut is so fascinating.

(Laughter) We live in a time when people are thinking about what new superfood smoothies we should be making and whether gluten is bad for us, yet we rarely know the specific anatomy and the mechanisms behind the organs that actually digest that food.

It's as if everyone is trying to figure out this magic trick, but no one is looking at the magician, and it's because he has a weird hairstyle or something.

And there's actually a reason science has hated the gut for so long, and it's this.

the gut is really complicated

It has a large surface area, about 40 times that of the skin.

Inside that leaky tube are a great many immune cells that are trained there.

There are 100 trillion bacteria living here doing all sorts of things and making small molecules.

And about 20 different hormones are produced, a complexity that's unmatched by, say, reproductive organs.

And the gut's nervous system is so complex that even if you cut it into pieces, when you poke it, each one will murmur back to you in a friendly way, like an independent creature.

(Laughter) On the one hand, this is what makes the gut so fascinating and important.

There were three steps to loving your gut.

Today I'm going to show you these three steps.

First of all, you just look at your gut, and you're like, "What does this do?"

It makes me wonder, "Why do you look so creepy sometimes?"

Actually, it wasn't me who first asked this question, it was my roommate.

After a party one night, he came into the kitchen and said, "You're studying medicine, Julia. How does a bowel movement work?"

(Laughter) Yes, I did study medicine, but I didn't know, so I went to my room and looked up different books.

And then I found something that I thought was interesting.

It turns out that we don't just have an external sphincter, we also have an internal sphincter.

You know, you can control the external sphincter, so you know what it's doing, but you can't control the internal sphincter.

There, any post-digestion residue (stool) first reaches the internal sphincter.

The internal sphincter reflexively opens and lets a little bit of it pass through.

(Laughter) And there are sensory cells that analyze what's being delivered, so is it a gas or a solid?

We then transmit this information to the brain, and the brain makes a decision, "Oh, I need to go to the bathroom."

(Laughter) And then the brain, with its amazing conscious work, accomplishes what it's designed to do.

Your brain will adjust your relationship with your surroundings and say something like, "Check done.

We're at the TEDx conference—" (Laughter) (Applause) Gas?

If you're sitting on the edge of the seat, and if you can finish things quietly...

(Laughter) But if it's a solid - we'll get to that later...

(Laughter) The external sphincter muscle and the brain are connected by neurons, and they work together and work together to get the stool back into the intestinal queue.

(Laughter) We humans are actually one of the very few animals that can defecate in a very good and clean way.

To be honest, I've developed a newfound respect for this wonderful thing called the internal sphincter, one that only cares about your husband each time, even though it's not connected to the nerves that care too much about the outside world and time.

i thought it was amazing

I used to not like public restrooms very much, but now I can go anywhere, because my internal sphincter frequently seems to tell me that my daily appointment time has come.

(Laughter) And then the next thing I learned was that by taking a closer look at the things I probably would have turned a blind eye to in the past -- the creepiest parts of myself -- I felt less fear and more self-awareness.

In fact, when I look at my intestines, this happens over and over again.

When you're in a group of friends or in an office meeting, you'll hear this funny rumbling noise -- "round, round, round, round, round, round, round, round..."

it's not because you're hungry

It's because our small intestine is a big clean lover. It cleans everything while it's not digesting, and as a result, eight meters of intestine -- seven meters of it, actually -- is completely clean and almost odorless.

To accomplish this, after digestion is complete, a powerful muscular peristalsis occurs that pushes any residue forward.

Here, sometimes there is a sound, but not always.

Sounds that we are ashamed of are signals that our stomachs are healthy and clean.

This strange, crooked shape of our stomach is kind of creepy.

And that's why, in fact, when we laugh or play sports, we can apply pressure without vomiting, because the pressure moves upwards instead of sideways.

There are also air bubbles here, which often show up very well on x-rays, but sometimes if they get too big, some people feel sick or have a sensation of pain.

But most people are much more likely to burp if they lie on their left side instead of their right side.

And it took me a little bit further in my thinking to see the body and health as a whole.

This was after hearing that someone had committed suicide.

The day before, I happened to be sitting next to the man who committed suicide, and I noticed that he had bad breath.

The next day, I learned about the suicide, and I wondered if my gut had something to do with it.

I was fascinated and started looking to see if there were any papers on the connection between the gut and the brain.

Surprisingly, I found many

We've found that sometimes it's not as simple as we think.

Our brains make commands and pass them on to other organs, and we tend to think that our organs have to obey.

But in reality, only about 10 percent of the nerves that connect the brain to the gut carry information from the brain to the gut.

For example, in a stressful situation, neurotransmitters released from the brain are felt in the gut, and the gut tries to slow everything down. In an effort to conserve energy for problem solving, the gut stops moving, reducing blood flow and energy expenditure.

This can lead to mental vomiting and even diarrhea in an attempt to rid the intestines of food they don't want to continue digesting.

Perhaps more interestingly, 90 percent of the nerve fibers that connect the gut to the brain carry information from the gut to the brain.

If you think about it further, our brains are so isolated that we need information from the outside.

The brain is housed in a skull surrounded by thick skin and bones, and it needs information to integrate the feeling of, "Am I doing well in my body as a whole?"

In fact, the gut is probably the brain's most important advisor, because it's the largest sensory organ, gathering information not only about the quality of the nutrients we consume, but also about the state of our immune cells and the hormones in our blood that the gut can sense.

The gut can package this information and send it to the brain.

That information can't reach the visual cortex or the language cortex, or we'll end up seeing strange colors and making funny sounds as we digest food.

But information from the gut can reach areas of ethics, fear, emotional processing, and self-awareness.

So when our bodies and brains integrate the feeling of, "Am I doing well as a whole body?"

It really makes sense to be able to contribute

It also makes sense that people with conditions like irritable bowel syndrome and inflammatory bowel disease are at higher risk for anxiety and depression.

I think this is good information to share, because everyone thinks, "I have a bad gut, and I don't have a good mental state."

And maybe this is -- it's not scientifically clear right now, but maybe it's just the brain taking pity on the gut.

There's not enough evidence for this to be practical knowledge.

But just knowing that this kind of research is going on around the world today can help you in your day-to-day life.

It makes me think of my depression in a different way, and I don't show it as much.

When we're awake, it feels as though our existence is just a brain and a computer screen, and that's where we're tempted to immediately look for answers and start thinking about the silly work we do and our neighbors.

Just knowing that helped me. For example, when I wake up too early in the morning, I start worrying and ruminating.

And I think, "Wait a minute, what did you eat yesterday?

Was it stressful?

did you eat anything late at night? ”

Then I wake up, make some tea, and eat an easy-to-digest snack.

It's simple, and it makes you feel amazing

In the third step, I got further out of my body and really understood bacteria in a different way.

The research we do today has created a new definition of what true cleanliness is.

It's not the hygiene hypothesis you know.

Keep it clean, too few microbes in the environment is not a good thing, it increases allergies and autoimmune diseases.

I was aware of this hypothesis and thought that I wouldn't be able to learn much from focusing on intestinal cleanliness.

but it was a mistake

True cleanliness isn't about killing germs instantly.

True cleanliness is a little different

If you look at the facts, 95% of all the bacteria on this planet don't have genes that don't harm us or harm us.

Many bacteria actually help a lot, and now scientists are investigating: Do certain bacteria help clean the gut?

Help with digestion?

Is it the cause of weight gain and loss even if you eat a lot in the same way?

Does it make us braver or more resilient to stress?

And when it comes to cleanliness, there are more questions.

I think it's actually a healthy balance.

You can't always avoid bad things

It's simply not possible. Something bad is always around.

A clean gut as a whole has enough good bacteria and a few bad ones.

The immune system also needs bad bacteria, so it knows what to watch out for.

So I started to think differently about cleanliness, and a few weeks later, I gave a talk at my university and made a terrible mistake.

As soon as I got home, I realized I was like, "Oh, my mistake.

No more, I'm tired of it, I'm not embarrassed."

When I started thinking about this, I was like, "Ah!"

After a while, I said, "It's okay, I made one mistake here, but I said a lot of useful, correct, and useful things, so I think I'll be fine.

Same thing with "cleanliness"

Then, "Oh, wait a minute.

Maybe I've developed a more advanced understanding of cleanliness."

That's my current theory.

It's just taking the theory of cleaning your living room and taking it a little further into what you might call "hygiene for life."

Knowing about promoting the good as well as trying to protect myself from the bad has had a very calming effect on me.

In that sense, I hope that today's talk, as a whole, has been meaningful and helpful. Thank you for your time, and thank you for listening.

(applause)

congratulations

You, who are here, alive and listening, part of the evolutionary breed, are one of the greatest winners of all time, and you are at the top of a four billion year old success story.

you are 1% of all living things

The losers, 99% of the species that ever existed, have died out due to fires, floods, asteroid predation, starvation, glaciers, heat or ruthless natural selection.

Your ancestors have survived all these challenges since they were the oldest fish.

You're all here because of the golden opportunity that the mass extinction presented.

(Laughter) It's true.

The same is with you the winning relatives

The same can be said for the 34,000 species of fish.

How did we get so lucky?

And will they continue to win?

As a fish paleontologist, I use big data, the fossil record, to study what makes a species win or lose.

Modern species won't tell you, because they only know how to win.

So we need to ask extinct species

How to make extinct fish speak?

There are many beautiful fish fossils in museums, but their true beauty comes out when you combine them with many more ugly, broken fossils and put them in the form of 1's and 0's.

You can comb through a database of 500 million years and get patterns of evolution.

For example, fish morphology can be mapped and transformed to reveal key pathways of change and changes over time.

This is the story of the winners and losers in one key event that I discovered using fossil data.

First, let's go back to 360 million years ago, the Devonian period, six times older than the end of the dinosaur age.

They were dominated by predators with razor-blade jaws and armor-like hard shells, and giant fish with arm bones in their fins.

Crab-like fish were roaming the seafloor.

A small group of ray-finned fish, relatives of salmon and tuna, were timidly at the bottom of the food chain.

A few primitive sharks lived in fear offshore.

Your ancestors, four-legged vertebrates, were just a few species that managed to survive in the tropical alluvial plains.

the ecosystem was crowded

I saw no escape, no opportunity

and the world is over

(Laughter) It was a good thing.

359 million years ago, the Hangenberg event wiped out 96 percent of all fish species, between the Fire and Ice periods.

In a world crowded with living things, the order collapsed and was swept away by a great wave of change.

Now, you might think that this is the end of the story.

The strong have fallen, the weak have inherited the earth, and now there is mankind

But winning is not so simple

The handful of animals that survived belonged to different groups, but each group had far more dead members.

The survivors were predators at the top of the food chain, prey species at the bottom, large and small, marine and freshwater.

The mass extinction was like a filter.

It just flattened the playing field

What really matters is what the survivors did in the next few million years in a devastated world.

The former rulers should have had the upper hand

They got bigger, they stored up energy, they devoted themselves to raising their children, they spread across the globe, they gorged themselves on fish, and they waited while they continued to do what had worked so well.

But it only held out for a short time, then declined without any new changes, and is now a living fossil.

They never changed their old way of life and are now largely forgotten.

A few species of ray-finned fish, sharks, and tetrapods that had been on the back foot for so long went in exactly the opposite direction.

They got smaller, they had a faster life cycle, they lived shorter, they ate less and they reproduced faster.

They experimented with new foods, lived in different habitats, and transformed their heads and torsos into strange shapes.

(Laughter) And they found a chance to survive, thrive, and win the future of 60,000 species living today, including humans.

That's why it looks familiar

The name you know

Winning the fight for survival isn't an accident, it's not an arms race.

Rather, the surviving species took a different path in evolution.

Some have been astonishingly successful, while others have fallen into "Deadfish Walking."

(Laughter) This is an actual scientific term.

(Laughter) What I'm investigating is how these evolutionary paths of victory and defeat have been repeated.

My lab has already compiled a database of thousands of dead fish species, and many more remain.

But what is already clear is that your ancestors survived the mass extinction and successfully dealt with the aftermath of the mass extinction, and you are who you are today.

What does this tell us about our future?

As long as a handful of species survive, life will revive.

Living organisms that survive gracefully and fortunately not only take over from dead organisms, but also acquire new forms.

But it may be millions of years before that happens.

thank you

(applause)

By bad timing, you and your partner have become one of the most infamous bank robbers in the West.

Now jailbreak needs that timing

Walk near the electric fence at the appointed time

Your partner will signal you to short out the electrical circuit in the fence exactly 45 seconds later.

The fence will automatically snap back in a second or two, but if you move quickly, you'll be free to go home.

But then, to my horror, I realized that my clock was broken, and I didn't have time to fix it.

The time is approaching, and if you miss even the slightest 45 seconds, you'll be charred.

I rummaged through my pockets and found something that might work: a lighter and two fuses of labor.

The fuse is made of highly flammable twine that burns out in exactly one minute from either end.

The problem is that even though it looks uniform, it burns unevenly. So, for example, if you cut a stick in half, one side might burn longer.

Your partner is about to send a signal and you have to do something.

Can you time 45 seconds with a fuse and a lighter?

stop the video and think

To answer 3 To answer 2 To answer 1 The length of the fuse gives no clues, but it takes exactly 60 seconds to burn everything.

The key idea is this: 30 seconds after you light the end, you still have 30 seconds of fuse left.

If you light it from the other side, you'll end up in the same spot 30 seconds later.

So if you light both ends at the same time, it will burn out in exactly 30 seconds.

But what do you do with the remaining 15 seconds?

Now we need a second fuse

If it burns out in 30 seconds, you can use the same trick, doubling the rate at which it burns so that it burns out in exactly 15 seconds.

Now you realize that you can make the second one shorter by igniting the end of the second one at the same time as the first one.

The moment the first one burns out, the second one has 30 seconds of length left.

Just when you've found a solution, you pick up the signal from your partner and jump right into action.

Bring the 4 ends of the 2 fuses together and light 3 of them.

As soon as the first one burns out, light the second one.

When the fire flickered and went out, it turned out that exactly 45 seconds had passed and the fence had lost power.

By the time the fence comes back up, you're over the fence and free to go home.

Other than sheltering from the rain and creating a usable space, architecture is a kind of special effect that either entertains or disturbs the senses.

Our work spans all media and comes in all shapes and sizes.

Small and big, this is an ashtray and a cup.

From city planning to comprehensive design to things like theaters

What they all have in common is that they challenge preconceptions and conventions about space.

They're so familiar to us every day that they're so obvious that we don't even notice them.

I've put together a kind of sample of "productive nihilism" that can help you create certain special effects, and I'd like to share it with you.

So it's like "nothing" or "nearly nothing".

It's done by subtracting, or by hindering or interfering with the world that we're usually unaware of.

It won a competition as an exhibition pavilion for the Swiss Expo 2002 on Lake Neukatel, near Geneva, Switzerland.

Here, we used water not just as an environment, but as a building material.

I wanted to create architecture made of air.

No walls, no roof, no purpose, water turned into mist, big clouds.

This proposal is a counter to the recent glut of emerging technologies at national and international exhibitions.In recent years, the increasingly plethora of digital feats are trying to satisfy our insatiable appetite for visual stimulation.

"Higher definition" is now the canon in our opinion.

I asked: Can we use advanced technology to make our exhibition pavilions decisively low-resolution and obscure, challenging conventions about space and surfaces, and rethinking our very reliance on vision? and

So I tried doing something like

It takes the water from the lake, filters it, and then blows it out as a mist through 35,000 high-pressure nozzles, with weather stations built into the buildings.

It reads the changing temperature, humidity, wind direction, wind speed, and condensation temperature, and then calculates them in a central computer to adjust the pressure and distribution of the water discharge.

Reactive system calibrated for real weather

Under construction photos, it's a tensegrity structure.

It's about 100 meters wide, about the size of a football field, and it sits on four very delicate pillars.

This is the fog nozzle that interfaces with the system to read atmospheric conditions and create semi-artificial, semi-natural weather.

I mean, I was interested in making the weather, I don't know why.

So here's one outside and one inside, so you can see what kind of place it is.

So going into "Blur" instead of into normal space is like entering "inhabitable medium."

It has no shape, no character, no depth, no sense of scale, no scale, no purpose, no fixed size.

No reference, no visual whiteout, just the pulsating noise of the nozzle.

So this is an exhibition hall where there is absolutely nothing to see or do.

I'd like to brag -- I've created a "magnificent panorama," and I've flipped all the conventions on how to create a grand spectacle.

Visitors' expectations for the climax of the production are replaced by a constant fog of anxiety and diminished attention, and are scattered.

It's very similar to how the Victorian novels used fog, very similar.

By blurring the focus on the world, we bring our visual addiction into focus.

Once disorientated, spectators ascend to the "Angel's Deck" and then descend to this water bar below the rim.

In this world, water is used for everything, and you can reach the water, move around in the water, breathe the water, drink the pavilion.

This is kind of a subject, but I think it goes a little deeper.

We want to emphasize our absolute reliance on this primary sense, and share this sense with our other senses.

When we did this project, it was very hard to understand.The Swiss government said, "Why are you going to spend ten million dollars to recreate that hateful fog that's everywhere?"

we tried to persuade them

In the end, we made it a national icon of Switzerland.

Either way, it's a temporary structure that was eventually demolished and is now a phantom memory, but it survives in edible form.

And this is the highest award given to an architect in Switzerland - to be a chocolate bar.

let's go next

We were known in the '80s and '90s as installation artists or architects, creating individual works commissioned by museums and non-profit organizations.

He's done a lot of media work and done a lot of experimental theatrical projects.

In 2003, the Whitney Museum of American Art organized a retrospective of our work, which included many of these works from the '80s and '90s.

But the works themselves were very much against the character of a "retrospective", and the exhibits were:

This is a piece about tourism in the United States

This is from 42nd Street called "Soft Cell"

It was done at the Fondation Cartier

It is part of a project called "Master/Slave" and "Parasite" at MOMA.

In other words, there were many such things.

The museum let us use all four floors, and the problem with the retrospective was that we weren't feeling very well.

It was designed by museums to give the public a comprehensive understanding of a group of works.

But our work didn't come together as one piece.

A recurring theme in those works was something like hostility to the museum itself, questioning museum conventions, like the white walls.

Here is a drawing that lays out the various installations

I ended up putting a white wall in there to separate the pieces that couldn't be grouped together.

The white wall itself became a target and a weapon at the same time.

We used that wall to separate the 13 installations to separate the acoustics and the space.

And the red dotted line that you see here is the path through which the objects that perform here are, and it's a new thing that we've made -- we made it for this -- that's basically a robotic drill that's going to move around the walls of the museum, breaking down more and more walls.

The drill is attached to the robot arm

It was a collaboration with Honeybee Robotics, and this is the controller.

Honeybee Robotics, the company that built the drill for Mars exploration, was a really fun collaboration.

While they were working with us, they neglected their main job, working with the government.

The mechanism is that a computerized controller creates a map of the entire wall.

When expanded, it will be about 100 meters in total length

Randomly generate points on that three-dimensional grid

You pick a point in it, you take the drill there, you drill a hole in the drywall there, you drill a little over an inch, and then you move it to another spot.

At first, these holes are scattered scars, but as the days of the exhibition pass, more and more holes will appear.

In the end, the positions of the holes on both sides of the wall connect so that one gallery can see the other.

The holes cluster together and punch holes all over the wall.

The wall itself becomes performance art for three months, and the wall becomes an increasingly unstable element.

It will become impossible to block the sound

visually so

And he's always moaning in the background of the exhibition, which is very annoying.

It's a dark room here, but the video footage is completely useless.

In other words, the wall, which provided a stable backdrop for the exhibition, is as actively attracting attention as the work itself.

This sonic and visual annoyance itself reveals the artist's displeasure with the enveloping nature of such a retrospective.

When this device started destroying the descriptions on the walls here and there

It felt really good. Now about the project that ended about a year ago.

Let me tell you, this is the ICA, the Contemporary Art Association, on the Boston waterfront.

I don't have a lot of time to show you, but this building is a good compromise between the attention directed to the outside of the place -- this Boston waterfront is a really nice view -- and the desire to keep the museum focused on the inside.

So the nature of this building is to see to see - that's the primary purpose of both the exhibition program and the idea of ​​the building.

The building -- it takes in the landscape, but it's staged as a museum in such a way that the landscape is consumed very little by little.

When you walk into the building, you're crammed into a very tight space in the theater -- in the belly of the theater -- and you can't see the view from there.

From there, take a glass elevator near the curtain wall to the top.

This elevator is about the size of a New York loft.

When you get to the top, the scenery looks like this, and when you reach the theater, the scenery can be blocked or opened.

It can also be used as a backdrop for the stage. Many musicians seem to choose to open the entire glass wall.

The galleries block out the landscape, letting in only natural light, and then the northern gallery once again offers a great panorama.

The original intention of this place, which unfortunately never materialized, was to use lenticular glass to show only the vertical landscape.

This narrow space that connects the East and West galleries is not meant to reach a climax, but rather lets the scenery creep up on you so that you can only see it while you're walking from end to end.

The plan was canceled because the scenery was too beautiful.

I said, "No, make sure you can see the scenery here." Architects lose here...

But the best - and this is also the theme of my talk - is this mediatique, which hangs from the cantilever.

25 meters of cantilevered structure - pretty awesome

That alone already jumps out into space, and from there there's the mediatique in this little part.

Mediatique has 16 stations where the audience can access a server to view digital art and works of art selected from the internet.

This is a very important part of this building, and the point here is that the architecture has nothing to do with technology, it's just creating a "picture frame," cutting out the scenery of an industrial port, and through the walls, through the floor and the ceiling, showing just the water, just the surface of the water, just like electric snow or lava lamps, creating a hypnotic effect.

I think this part of the project is the perfect blend of technology and nature.

And there's no information there -- it's just hypnotic.

talk about lincoln center

Here are the guys who worked on the first project, 50 years ago.

We take it and do it on a variety of scales, from small repairs to major renovations and expansions.

I do it without male hormones

This is the scope of work up to 2010

For the sake of this speech, I'm only going to talk about some or just a few of the projects that are related to the theme of architectural special effects.

This is Alice Tully Hall, hidden under the Juilliard building, hidden under the Juilliard building, but several floors below the street.

This is the former entrance to Tally Hall, where renovations have just begun.

We asked ourselves: Why shouldn't this building be as flashy as the Metropolitan Opera and other Lincoln Center buildings?

What we were asked to do was give it street character, extend the lobby and make it visible.

So we stripped this otherwise closed building.

So basically, I did an architectural striptease. I put together a canopy like this, and then I took the underside of the third-story extension of Juilliard, but it's 4,000 square meters, and I cut it at the angle of Broadway Street and extended it to frame the tally hall.

Here's a before and after picture. Wait, we're still on the way.

I'm going to spend the rest of my time here talking about the hall itself, where I'm doing some really big work.

This hall is multi-purpose.

Our client wanted us to turn this into a great chamber music hall.

Building a hall for chamber music with 1,100 seats is extremely difficult.

The words "chamber music" and "chamber" are associated with "salons" and small performances.

It is necessary to bring in "familiarity" How to bring "familiarity" in the Great Hall?

For us, "familiarity" means many things.

Acoustic and Visual Familiarity

One of the problems was that the subway was thundering right under the hall.

Another problem was the shape of the hall

It's coffin-shaped, and every sound travels down the aisle like a gutterball.

The walls are made of sound-absorbing material, which is semi-absorbing, semi-reflecting, and not very good for orchestral sounds.

This is Avery Fisher Hall, and "visual junk" is very important for removing visual noise.

None of the chairs could be removed, so the construction was limited to a width of 45 centimeters.

It's a very thin building.

So the first thing we did was separate the spaces from each other, to block out the noise from the subway.

Then I wrapped the whole hall - like an Olivetti keyboard - with wooden material, and it covered all the surfaces: the walls, the ceiling, the floor, the stage, the stairs, everything, even the box seats.

Acoustically, we're trying to keep the sound in the room and back to the stage, and this is the acoustic shelf.

Looking up at the hall Part of the stage

We covered just about everything, anything we could think of, we covered it with a high-performance surface.

and one more

We've stripped away any visual distractions that might be blocking the "intimacy" of the hall, and we've connected the building and the audience with the performers.

We believe that concert halls are just as theatrical during intermissions, after arrival, and so on, as they are after the concert begins.

So we wanted this kind of effect -- this kind of light effect, so we bioengineered a wooden wall.

Using very thick resin and the same veneer as the walls of the entire hall, we wrapped the hall with a belt of light in a seamless continuity, connecting the audience and the performers without creating a sort of proscenium separating the audience and the performers.

Here's a model in Salt Lake City, so you can get a feel for what it would look like in full size.

I've got people sitting in Salt Lake City to show you what it's like.

(Laughter) I think it's very strange, because the minute the noise in the hall goes down, the audience waits for the music to start, and just as the curtains open and the chandelier goes up, the walls start to ooze light, and at that moment, the audience's attention is drawn away from the stage.

This is Tally Hall under construction

No closing words, we're running out of time

Thank you very much

(applause)

I brought you something beautiful here today.

This is the feather of one of Kenya's most beautiful birds, the great crowned guinea fowl.

But these feathers mean more than that.

If you've ever been out in the field and spent some time looking at the feathers around you, you've probably noticed that feathers come in all different sizes and shapes and colors.

Feathers are one of nature's most amazing technologies, and for centuries they've kept birds dry, warm, and the engine of flight.

Only some people in the tree of life can make wings.

Of all the animals in the world, only birds can make what I have today.

There's a nickname I gave my bird

Because that's what separates birds from all other animals on Earth. If you can't make feathers, you can't call yourself a bird.

(Laughter) For those of us who can't fly, birds represent freedom.

Feathers help birds overcome gravity and soar into the air in spectacular ways.

Ever wanted to fly like a bird?

I'm passionate about birds and I want to change the way people think about birds.

The simplest reason why I love birds so much is because they're beautiful.

There are 10,000 species of birds in the world, each with its own unique beauty.

Birds are wonderful creatures, and this talk is dedicated to them all over the world.

(Laughter) (Applause) Birds have been a part of our lives and cultures all over the world for centuries, and each society has their own legends about them.

Perhaps, as a child, you've heard all kinds of stories about birds and how birds interact with people.

I myself recently learned that our ancestors chased flocks of vultures to find carrion dropped by large carnivores, and humans scavenged and ate some of the meat.

Birds are also used as brands and labels around the world.

You know the bald eagle, right?

It was chosen for the coat of arms of the United States because of its majestic strength, its beautiful appearance, and its longevity.

Just as we humans can adapt to most habitats on Earth, birds are conquering the world.

From these beautiful penguins that live in the cold polar ice caps, to the larks that live in the hottest deserts imaginable.

These birds are just conquering the planet.

Birds build homes just like us

Professional home builders belong to a group of birds called weaverbirds, so named because of the way they weave their nests.

Here's an interesting fact: Birds, like us humans, love and date.

You might be surprised to hear that males dress up to get females to like them, but let me show you.

This photo is of a black robin This is the normal appearance of this bird

But when breeding season comes, everything changes, and this is what it looks like at that time.

(audience murmurs) Isn't that great?

And many different kinds of birds like to interact and cuddle, just like humans do.

I think you might be wondering about this too.

Yes, I kiss you, sometimes really hard

(Applause) Some birds even cheat.

(Laughter) For example, African Jacana females, after mating with a number of males, fly off in search of new males and leave them behind to care for their chicks.

(Laughter) (Applause) Birds help us a lot and play an important role in our ecosystem every day.

Vultures scavenge the environment, digesting disease-causing pathogens and removing them from the environment is a huge expense, and they eat up all the carcasses.

In large flocks, vultures can decompose a carcass the size of a zebra in just 30 minutes.

Owls get rid of rodents, and that's a huge contribution. It saves us money, which means we don't lose crops, and we don't have to buy toxic chemicals to get rid of rodents.

The beautiful sunbirds that surround us are one of nature's pollinators, helping plants produce fruit.

They have long been working with other pollinators, insects, to help us get the crops we need to survive.

Unfortunately, stories about birds are not without problems.

Everywhere they live, they fight for their survival every day.

The biggest threats to birds are habitat loss and food shortages.

Birds, especially migratory birds and ducks that gather in wetlands, are also hunted.

Poisoning of flocking birds has also occurred, especially in areas where rice is grown.

In addition, there have been cases of birds being electrocuted by power lines, and birds being torn apart by the blades of wind turbines.

Climate change is all the headlines these days, and it's also affecting birds because they're forced to migrate in search of better breeding and feeding grounds, and they can't survive in their old habitats.

It wasn't until I was in high school that my personal view of birds changed, when a boy hit a bird called a common buzzard, injuring its wings and legs.

I stood there frozen, and I was only 14 years old, so I tried to imagine if something similar happened to humans. Birds can't take care of themselves.

I wasn't quite a biologist at the time, but I decided with three friends to take care of the birds until they had recovered and were ready to be released.

Interestingly, the birds accepted leftover beef from the school cafeteria, and for dinner we caught termites on the property.

After a few days, I regained my strength and released the bird.

The three of us were really happy to see it flutter gracefully while flapping its wings.

That experience changed my perspective on birds.

That led me to publish a magazine, and I called it "Hawk Magazine," in honor of the bird I saved in high school.

My experience in high school at the time was the starting point for what I am now an animal rights activist.

A passion for birds should be especially important for Africa, for all Africans, because of all the continents of the world, Africa is home to some of the most spectacular birds in the world.

There's even a bird called the shoebill

the name of this bird

Countries such as the Democratic Republic of the Congo, Tanzania, Uganda and Kenya lead the continent in terms of bird diversity.

These birds provide the vital ecosystems that Africa needs.

And because of that, Africa has the potential to become the world's leading avian tourist destination.

It will certainly make a big contribution to the economy.

Think about the potential that community has for a group of tourists visiting to see birds that are unique to that village.

How can we all protect birds?

Everyone here has an opportunity to use their passion for birds to contribute to their survival, and that's possible by becoming a citizen scientist.

Citizen science is growing in popularity around the world, creating situations where participants can provide up-to-date traffic and safety information to people in their communities.

This possibility is exactly what bird watchers felt. We thought that because birds live everywhere, if you, everyone in Africa, could tell us which birds live where you live, where you go to school, where you work, then we could map all the species of birds that live, and with this information, scientists could prioritize the habitats that need the most protection.

I'll give you two examples. The Africa Raptor Databank maps all the raptors that live on the African continent, and the Kenya Bird Map maps about 1,100 species in my home country of Kenya.

The databases for these two projects are already online, and the public can contribute data, and we're using this data to create an interactive website that the public can use to make plans.

But when I started, there was a big stumbling block.

I got a lot of complaints from birdwatchers, and they said, "I live in a village and I don't have a computer.

How do I report what birds are in my village, the school I go to, or where I work? ”

So I was forced to change my strategy and try to come up with a sustainable solution.

It's actually quite simple, and what I quickly discovered was that mobile phones were becoming more popular in Africa, and they were available in most parts of the world.

So we've developed an app for mobile phones, and we've made this app available for iPhones and Androids, and it's free for any birdwatching enthusiast to download.

It's called BirdLasser, which is used by the Kenya Bird Map, and an app called "African Raptor Observations" is now used by the African Raptor DataBank.

This proposal has taken our work forward by leaps and bounds, and we've been able to get a huge amount of data from bird enthusiasts in different regions.

Through this experience, we've realized that citizen science is very powerful because it's flexible and adaptable.

We were able to change the mindset of birdwatchers, so that they could exchange information.

When we started out, we didn't realize that birds could be a powerful way to contribute to the conservation of other animals.

The Virtual Museum for Africa now maps dragonflies, damselflies, butterflies, moths, reptiles, frogs, orchids, spiders, scorpions, even mushrooms.

Who would have thought we could map mushrooms?

This fact shows that we have succeeded in creating a large community that cares about African nature.

I would like to invite all of you to join me in promoting the importance of birds in your communities.

Tell your friends how wonderful birds are, because if you know what they are, it's the psychology of loving and caring for them.

A few minutes in your spare time At work, at school, at home, and see these beautiful birds in your surroundings.

Get involved in citizen science. Tell us about the birds you see in the places you visit.

There's something simpler: buy your child or sibling a pair of binoculars or a bird book to help them understand how beautiful birds can be.

By doing so, maybe one day you'll want to protect someone you love and care about.

children are our future

Let's teach our feather makers to take care of themselves, so that our love of birds can be a powerful catalyst for taking care of all living things in nature.

thank you

(Applause) Thank you.

I am the product of a bold decision by a leader.

After Tunisia gained independence in 1956, its first president, Habib Bourguiba, decided to invest 20 percent of the state budget in education.

Yeah, 20%, which is pretty high by today's standards.

some people were against

What about infrastructure?

What about electricity, roads and water?

Aren't those things important?

In my opinion, the most important infrastructure we have is people, educated people.

President Bourguiba helped build free, quality education for every boy and girl.

And I, along with millions of other Tunisians, have benefited deeply from that historic decision.

That's why I'm here today because right now we're facing a global learning crisis.

It's a "learning crisis," not an "education crisis," because there are 250 million children who are out of school today, and an even larger number of 330 million children who are in school but not learning properly.

If nothing is done, if nothing changes, by 2030, just 13 years from now, half of the world's children and young people -- half of the 1.6 billion people -- will be out of school or not learning.

So two years ago, I became a member of the school board.

The commission was convened by Gordon Brown, former British Prime Minister and United Nations Special Envoy for Education.

The first challenge was to find out: How big is the learning crisis?

What is the extent of the actual problem?

What we do know so far is that by 2030, half of the world's children will not be learning.

And what we've discovered is that we have to shift the focus of the world, from going to school to learning, from just how many people are in the classroom to how many people are actually learning.

And the second big question is, is there anything we can do? is

What can be done about this gigantic, vast, but silent and perhaps most neglected international crisis?

And I found out that there is

it's really amazing

For the first time in history, we can get every child in school and learning, in just one generation.

No need to start from scratch

You just need to learn from the best practices in your classroom, not the ones that apply to any classroom, but the best in your own classroom.

What we actually did was look at countries by income level: low-income countries, middle-income countries, high-income countries, and so on.

When we looked at what was happening in the top 25 percent of countries that improved the fastest in education, we found that if every country changed at the same rate as the fastest improving countries in terms of their income levels, we could get every child in school and learning in just one generation.

Let me give you an example

Tunisia for example

I'm not telling Tunisia to change as fast as Finland.

I'm not making fun of Finland

My proposal for Tunisia is: "Behold Vietnam."

Vietnam and Tunisia spend similar amounts of money on primary and secondary education as a percentage of GDP per capita, but Vietnam does better.

Vietnam has introduced standardized assessments of reading and numeracy, teachers are better supervised than in other developing countries, and student achievement is made public.

and the result shows

In 2015, PISA, or the OECD Program for Student Achievement, Vietnam outperformed the economies of the world, even better than the United States.

Now, non-educators might ask, "What's new and what's different?

Isn't every country tracking the progress of its students and making their achievements public? ”

No, it's a sad answer

It's a long way from that

Only half of developing countries have systematic learning assessments in primary school, and even less in lower secondary education.

So if we don't know if our children are learning, we can't focus our attention on teachers doing well, and we can't have countries prioritizing their education budgets to do well.

For this reason, the first big change before investing is to make the education system a successful one.

Putting more money into broken systems can only encourage inefficient spending.

And I'm deeply concerned that if kids go to school and they don't learn, the value of education will be devalued, the spending on education will be devalued, and governments and political parties will say things like, "We spend a lot of money on education, and our children aren't learning.

don't have the right skills

Maybe we should cut back on spending."

Now, improving the current education system into a successful one is important, but it's not enough.

What about countries that lack qualified teachers?

Somalia for example

Even if every student in Somalia became a teacher, even if every student with a college-level education became a teacher, there would not be enough teachers.

What about children in refugee camps and children in remote rural areas?

Filipe for example

Filipe lives in one of thousands of communities in the Amazon basin.

78 people and 20 families live in his village.

In 2015, grade 11 was just the two of us, Felipe and a friend.

Amazonas is in the northwest of Brazil

It's four and a half times the size of Germany, and the whole land is covered with jungle and rivers.

Ten years ago, Felipe and his fellow students had only two choices: move to Manaus, the capital, or quit school altogether.

But in 2009, Brazil enacted a new law that guaranteed secondary education to all Brazilians and required all states to do so by 2016.

But providing quality education is a big problem in Amazonas, and it's expensive.

How do we get math, science and history teachers in every community?

Even if they could find teachers, most of them wouldn't want to move to this area.

Faced with this impossible task, civil servants and state officials displayed a surprising amount of creativity and entrepreneurial spirit.

We developed a solution using the media center.

Here's how it works

Professionally trained subject teachers live in Manaus and deliver lessons via livestream to more than 1000 classrooms throughout the scattered community.

These classrooms hold anywhere from five to 25 students and are supported in their learning and development by homeroom teachers who guide them throughout the school life.

60 subject teachers in Manaus work with more than 2,200 teachers in these communities to customize lesson plans to suit their lifestyle and time of day.

So why is this distinction between subject teachers and homeroom teachers important?

First, as I said, many countries do not have enough qualified teachers.

Second, teachers have a lot of jobs that they're not trained to do, or that they're not supposed to do.

Take Chile for example

In Chile, there are 4.5 people involved per doctor, which means there are 4.5 staff supporting a doctor.

But in Chile, we have less than half a supporter per teacher, or even 0.3 supporters.

Imagine if you had 20, 40, 70 patients and one doctor doing all the work? No nurses, no paramedics, no one else.

You'd say it's absurd and impossible, but this is what teachers are doing all over the world every day, when they have 20, 40, 70 students in their classrooms.

So the distinction between subject teachers and homeroom teachers is amazing, because it changes the paradigm of teachers so that each teacher can do what they do best, and children can learn, not just be in school.

Some of these subject teachers have become famous teachers.

I ran for legislative elections and helped to improve the status of teachers, and as a result, more students wanted to become teachers.

And what I love about this example is beyond the teacher paradigm shift.

This example shows us how we can use technology for learning.

Because live streaming is interactive, Felipe and other students can present information back to them.

And we also know that technology isn't always perfect.

State officials estimate that between 5% and 15% of classrooms every day are unable to live stream due to flooding, antenna failures and internet connectivity issues.

Yet Felipe is one of more than 300,000 students who benefited from the media center solution and were able to reach post-primary education.

This example shows how technology is not just an adjunct, but a central means of learning, and how it can help bring children to school when they can't.

well i understand

You say, "How are we going to apply this to the world?"

Working in government myself, I've seen how even the best of these ideas are difficult to implement.

So, as a committee, we set out to do two things, to make the Learning Generation happen.

The first is called the Pioneer Nation Initiative.

More than 20 countries in Africa and Asia have made education a priority and have committed to transforming their education systems into performance achievements.

We've been training our country's leaders in what we call the "performance approach."

It basically consists of two things

During the planning phase, we bring everyone together in one room: teachers, teachers' unions, parents' associations, government officials, people from NGOs, everyone, so that everyone knows and everyone supports this change and the solutions that we have devised.

And in the second step, we do something special.

A relentless focus on follow-up

Week after week, we look at what's going on, what's been done, what's supposed to be done, and sometimes we actually send people out to the community or the school to check, not just hope it happens.

This may sound like common sense, but it's not common practice, and that's why so many transformations fail.

It's been piloted in Tanzania, where secondary school pass rates increased by 50 percent in just two years.

Now, the next step in realizing the Learning Generation is financial support. Who is going to pay for this?

We believe and advocate that domestic funding needs to be the primary source of investment in education.

Didn't we just talk about Vietnam? You outperformed the United States in PISA.

Not only because of a better education system, but because Vietnam has increased its investment from 7% to 20% of the national budget in 20 years.

What if countries wanted to borrow for education?

If you want to borrow money to build bridges and roads, it's pretty easy and obvious, but not for education.

It's easier to create a shiny blueprint of a bridge and show it to everyone than it is to show a blueprint of an educated human being.

Education is a long-term commitment

So I came up with a solution to avoid the "trap" that middle-income countries fall into. Middle-income countries aren't poor enough, or thankfully no longer, to have access to subsidies or interest-free loans.

We will pool contributions to educational lenders so that more money can be raised for education.

By subsidizing or taking on the full interest burden on loans, countries working for change can borrow money to transform their education systems, and make sure that this money can be repaid over the long term while benefiting from well-educated people.

This solution was presented at the last G20 meeting in Germany, and now education is finally on the international agenda.

Let me get back to my personal point here, because that's what this effect is all about.

Without the decision to invest the young country's budget, which means spending 20 percent of the young country's budget on education, I wouldn't be able to go to school, let alone become a minister in this government that successfully completed its transition in 2014.

Tunisia won the Nobel Peace Prize in 2015 as the only democracy to emerge from the "Arab Spring," but it was the result of a bold decision by its leader.

Education is the fight for citizenship, the fight for human rights in our generation.

Quality Education for All It's a Fight for Freedom and We Must Win

thank you

(applause)

When people talk about their fears about artificial intelligence (AI), they usually think of humanoids running amok.

Like "Terminator"

It's certainly something to consider, but it's not an immediate threat.

They also bring up metaphors from the past because of concerns about digital surveillance.

George Orwell's '1984' is another bestseller

It's a great novel, but it doesn't do justice to the dystopia of the 21st century.

What we should fear most is not what AI itself will do to us, but what those in power might covertly use to control and manipulate us in new, unpredictable and subtle ways.

In the near future, much of the technology that threatens our freedom and dignity is being developed by companies that capture our data and attention and sell it to advertisers and other customers: Facebook, Google, Amazon, Alibaba, Tencent.

AI is starting to enhance the business of those companies.

At first glance, you might think that AI is just a technology that follows online advertising.

but it's not

the categories are discontinuous

AI is a whole other world, and it holds great power.

AI has the potential to rapidly advance various research fields.

But, according to a famous Hollywood commentator, "With tremendous potential comes tremendous risk."

Fundamental Facts of Digital Life - Let's Look at Online Advertising

May I? I usually ignore

looks crude and ineffective

We've all had the experience of searching for something on the web, reading something, and being acted upon in response.

For example, if you find a pair of boots on the web, for the next week, wherever you go, ads for that boot will follow you.

Even if you buy it out of desperation, it will still come after you.

We're used to this kind of rudimentary, cheap consumer manipulation.

"Well, it doesn't work at all."

But advertising isn't the only use of digital technology online.

To understand that, let's consider an example from the physical world.

When you go to the supermarket, there are candy and gum near the cash register at the eye level of a child.

It's a way to trick the child into begging when the parent is trying to pay.

An example of a "persuasion architecture"

I don't like it, but it works anyway.

That's why you can find it in any supermarket.

In the physical world, these persuasion architectures are somewhat limited, because you can only have a limited number of items next to the cash register.

And candy and gum are the same products for everyone, but they're the most effective only for people with little ones.

In the physical world, we live with those constraints.

But in the digital world, persuasion architectures can be built at the scale of billions, and they can be targeted, reasoned, understood, and thrown at individuals, and they can figure out the weaknesses of each individual and send them to their smartphone screens, so the mechanics are invisible.

big difference

This is just one of the basic things that AI can do.

Let me give you an example

Let's say you want to sell airline tickets to Las Vegas.

In the old world, you would set the demographics that would be likely to buy based on experience and imagination.

If we were to advertise, we might target men between the ages of 25 and 35, or people with high credit card limits, or retired couples.

I would have done so before

With the advent of big data and machine learning, that doesn't work anymore.

To imagine what's going on Think of all the data Facebook has about you All your status updates you've ever entered All your Messenger conversations A record of where you logged in All the photos you've uploaded

If you start typing something and then change your mind and delete it, Facebook will also record and analyze it.

We are also steadily making comparisons with offline data.

We also buy a lot of data from data brokers.

It includes everything from financial records to vast browser histories.

In the United States, these data are routinely collected, collated and sold.

Europe has stricter rules.

So what happens is that a machine learning algorithm called a "learning algorithm" combines all the data and learns to identify characteristics of people who have bought a ticket to Las Vegas in the past.

As we learn from existing data, we also learn how to apply it to other people.

So if you have another user, you can classify whether that person is likely to buy a ticket to Las Vegas.

You see an ad for a flight to Las Vegas and think

"You can ignore me"

but that's not the point

The problem is that we no longer really understand how these complex algorithms work.

we don't know how to classify

You have a huge matrix with thousands or millions of rows and columns, and a programmer or someone else can look at that matrix, and even if they have all the data, they can't understand exactly how it's working.

It's no longer the level of programming, it's like cultivating an intelligence that surpasses human intelligence.

And because these mechanisms require so much data to work, they also have the power to look deep into all of us and force machine learning algorithms to work.

So Facebook tries to collect as much data as possible about you.

for the algorithm to work

Let's dig a little deeper into the Las Vegas example.

What if a system we don't understand decides that the most likely people to sell us tickets to Las Vegas are people with bipolar disorder who are on the verge of a manic episode?

People who are prone to overspending and addicted to gambling.

Even if I was selected by such criteria, I have no clue to know that fact.

Once, I asked computer scientists about this example, and one of them came to me later.

And with an anguished look, he said, "That's why I couldn't publish my paper."

"What are you doing?"

What he was trying to find out was, could social media posts tell you if you were going into a manic state before you had symptoms?

But the lack of papers doesn't solve the problem, because there are already a number of companies developing this kind of technology, and there's a lot more readily available.

it's not that hard anymore

Have you ever had the experience of going to the YouTube site with the intention of watching one video and watching 27 videos in an hour?

You know how on a YouTube page, in the right column, it says "next video" and it autoplays?

The algorithm picks out videos that it thinks might be of interest to you, but you might not be able to find them yourself.

not for people to judge

the algorithm decides

It takes things you've seen before, and things people like you have seen, and it tries to infer what you're interested in and what you'd like to see more of, and then shows you more.

It sounds like a harmless and useful feature, but that's not always the case.

In 2016, I went to a rally for then-presidential candidate Donald Trump and studied the movement of his supporters.

In social movement research, I also looked at Trump support.

I wanted to write something about Trump supporter rallies, so I watched them on YouTube a few times.

YouTube started recommending white supremacist videos to me and auto-playing them, and they started coming out with more and more radical stuff.

If I watched one, it would show me an even more extreme one, and it would play automatically.

If you watch a Hillary Clinton or Bernie Sanders video, YouTube will recommend videos about left-wing conspiracies and autoplay them, and it's going to get worse and worse.

You might think it's politics, but you're wrong.

not politics

It's just an algorithm reading human behavior.

One day, I saw a video about vegetarianism on YouTube, and YouTube recommended and autoplayed a video about living vegan.

It's as if I'm not prepared enough

(Laughter) What's going on?

YouTube's algorithm isn't public, but here's what I think.

If the algorithm can entice people to see more extreme images, they'll be less likely to leave the site, and they'll keep watching video after video and immersing themselves in the ads that Google displays.

Now, nobody cares if the seller is ethical or not, so these sites can profile people and classify them as people who hate Jews, people who think Jews are a parasite, people who post overtly anti-Semitic content, and then target them with ads.

Algorithms can also be used to find people who look like you, even if they don't have explicitly anti-Semitic statements in their profiles, but algorithms can detect and target ads to people who are susceptible to such messages.

It may sound crazy, but it's reality.

ProPublica researched that this feature is actually available on Facebook, and Facebook will even give you advice on how to get more visitors.

When BuzzFeed tried it on Google, it quickly became clear that yes, Google could do the same thing.

And it doesn't cost much

ProPublica reporters paid about $30 to target.

Last year, Donald Trump's social media rep revealed that Facebook's use of "dark posts" was intended to reverse mobilization, not to solicit voters, but to convince people not to vote at all.

And to do that, we targeted African men in key cities, like Philadelphia, and we read the person's words verbatim.

Here is a quote

What the camp used was, "You can limit the audience. You can specify the public range so that only the people we want to see will see it.

This is the purpose of the post

Dramatically impacting [Hillary's] power to get her supporters out on the ballot."

What was written in the dark post?

I do not understand

Facebook does not answer

Facebook also sorts posts algorithmically for your friends' posts and pages you follow.

Rather than displaying everything in chronological order,

It's showing them in the order that the algorithm thinks you'll be interested in and stay on the site longer.

This has many implications

Have you ever thought someone was ignoring you on Facebook?

Algorithms may not be showing your post to them.

Algorithms prioritize some posts and drown out others.

Experiments have shown that what an algorithm chooses to present to us affects how we feel.

but not only

Political behavior is also affected

During the 2010 midterm elections, Facebook conducted an experiment with 61 million Americans and later announced it.

For some people, I showed them a simple message, "Today is Election Day," and for others, I tweaked it a little to show thumbnail images of friends who clicked "I voted."

it's a simple trick

May I? The only difference was the photo, which was only posted once, but the study confirmed that voter rolls confirmed that 340,000 more people voted in this election.

Coincidence? no

Because in 2012, we're doing the same experiment.

This time, with just one public message, 270,000 more people voted.

For reference, the 2016 presidential election was decided by a margin of about 100,000 votes.

Also, even if you don't write political content, Facebook can easily infer your political beliefs.

You can do it very easily with an algorithm.

What if a platform with that kind of power decided to favor one candidate over another?

Do we have a way of knowing that?

Now, here's where we started with something that seems innocuous at first glance -- an online ad following us and ended up somewhere else.

As citizens, as citizens, we don't know if we're seeing the same information anymore, or what other people are seeing. Little by little, the lack of a common ground for information is making national debate impossible. And this is just the beginning.

These algorithms can fairly easily infer your race, your religion, your political views, your personality traits, your intelligence, your happiness, your drug use, your parents' divorce, your age, your gender, and other personal things from things like Facebook.

Algorithms like these can identify a protester, even if part of their face is obscured.

You may be able to guess your sexual orientation just by looking at your profile picture to find a date.

These judgments are probabilistic estimates, so they're not 100% correct, but it's hard to imagine that just some misjudgment would deter those in power from using these technologies, and of course there would be a whole host of ramifications.

Imagine what a nation could do if it had an enormous amount of data about its citizens.

China is already using facial recognition technology to identify and arrest people.

What's tragic is that we're building the infrastructure that enables surveillance dictatorships just to get you to click on our ads.

It won't be like Orwell's dictatorship.

It's different from "1984"

If you openly rule people with fear, even if everyone is afraid, we will hate it and resist it because we know what's going on.

But if those in power use these algorithms to surreptitiously monitor, discriminate, and harass us, to identify and mark those who are likely to cause trouble, to identify and mark rebellious ones, to make extensive use of persuasion architectures, to exploit individual weaknesses and vulnerabilities, and attempt to manipulate them one by one -- if they do so on a large scale through our personal screens so that we don't know what our fellow citizens and neighbors are seeing, then even if this dictatorship envelops us like a spider web, we can still be that You may never dream of being inside

Facebook's market capitalization is approaching $500 billion

Because the persuasion architecture works great.

But the architectural structure is the same whether the ad is selling shoes or a political belief.

Algorithms don't know the difference

The same algorithms that are thrown at us to make us more susceptible to advertising also orchestrate the flow of political, personal and social information that must change.

But don't get me wrong, we use digital technology because it provides great value.

I use Facebook to connect with friends and family around the world.

I've also written about how important social media is to social movements.

I've also studied how these technologies can be used to bypass censorship around the world.

But it's not that the leaders of Facebook and Google are maliciously and intentionally furthering the polarization of this country and the world and pushing it toward radicalization.

I've read a number of their statements about acting conscientiously.

But it's not the intentions and statements of the technical people that matter, it's the structures and business models they're building.

that's the crux of the problem

Could it be that Facebook is a giant $500 billion scam whose ads are ineffective on its site and that it's an impotent architecture for persuasion -- and if not, its influence raises serious concerns.

the truth is either

Same for Google

So what can we do?

the status quo needs to change

I can't give you a simple prescription, because we need to completely reinvent the way digital technology works today.

Everything from technology development methods to financial and other incentives is built into the system.

What we have to face and deal with is the structural challenge of the lack of transparency that proprietary, private algorithms bring, the opacity of machine learning, and the indiscriminate collection of information about individuals.

we are facing big challenges

Combining technology, creativity, yes, political power, we want to create an AI that will help us pursue our human goals, but that will also be constrained by our human values.

I know it's not easy

We may not even easily agree on the definition of that word.

And yet, if we take seriously how the systems we depend on so deeply operate, I don't think we can defer this discussion any longer.

These structures organize our actions and control what we can and cannot do.

It emphasizes that many of these platforms, supported by advertising revenue, are free to use.

So what we're selling is ourselves.

The digital economy we need is a system where our data and attention are not sold to the highest paying dictators and demagogue politicians.

(Applause) To go back to the words of Hollywood I mentioned earlier, even as we yearn for the tremendous potential of AI and the unfolding of digital technology, we must not look away from the tremendous threat, but right now.

thank you

(applause)

What if the daughter of a traditional family living in futuristic Africa was admitted to the best university in the galaxy on a planet far, far away?

And if you decide to go there?

Read a passage from my trilogy "Binti" I turned on the transporter and silently prayed

I don't know what to do if it doesn't work

It's a cheap transporter, so even a single drop of water - I'm more worried about a grain of sand - will short out if it gets inside.

Most of the time it's not working well, and I have to reboot over and over again until it finally works properly.

"Please just for now - just for now please," I prayed

The transporter trembles in the sand I watch with bated breath

Like a stone of prayer, this small, flat, black machine roars and rises slowly from the sand.

And finally got the strength to lift the load

I smiled

This should make it in time for the shuttle

I wiped the pigment from my forehead with my index finger and fell to my knees and touched the sand with my finger and rubbed the sweet-smelling red clay on the ground.

"Thank you" I whisper

You'll have to walk 10 minutes down a dark desert road.

The transporter is working, so we'll get there in time

Stand still and close your eyes

Everything in my life was now weighing heavily on my shoulders

For the first time in my life, I was trying to defy the part of my heart that was so strongly bound by tradition.

I'm leaving late at night so no one will notice

My nine siblings, except for my sister and brother, are all older than I am, which I never expected.

My parents never imagined that I could do this.

By the time everyone knows what I've done and where I'm going I'll be off the planet

Parents will turn against each other, realizing that I'm gone and I'll never come back

The four aunts and two uncles who live right there will all scream and tell how I've hurt the reputation of my family.

i will be a rogue

"Go on," I whispered to the transporter and stamped my foot on the ground.

The thin metal ring around my ankle rang loudly, but I stepped on the ground again.

It's best not to touch a transporter that's started anyway.

"Go ahead" and sweat rises on my forehead once more

It still won't move forward, so I try to push the two large suitcases on the force field.

The load goes smoothly and I breathe a sigh of relief

It seems that luck is watching a little

This novel is set in Africa in the distant future, where Binti, a Himba tribe, is a mathematics genius.

She was accepted into a university on a distant planet and decided to leave.

With the blood of the people in his body, and the teachings, customs, and even the soil of the people, Binti leaves the earth.

She becomes "more" than "something else" as the story progresses.

The notion of leaving but not abandoning one's origins and becoming "more" is one of the core of Afrofuturism. Simply put, Afrofuturism is a different type of science fiction.

The best way to explain the difference between classic science fiction and Afrofuturism is to compare it to an octopus.

Like humans, octopuses are among the most intelligent creatures on the planet.

But octopus intelligence evolved from a different lineage, far from the human evolutionary trajectory, with a different underpinning.

The same is true for various forms of science fiction.

A lot of science fiction fantasizes about technology, about society, about social issues, far from Earth, on Earth.

And where science fiction is the most effective form of expression is in politics.

Science fiction always asks, "What if?"

And yet, not all science fiction has the same ancestry, and not all science fiction has Western roots and is centered around white men.

Science fiction isn't just about Isaac Asimov, Jules Verne, H.G. Wells, George Orwell, Robert Heinlein.

So what if a Nigerian-American writes science fiction?

Growing up, I didn't read much science fiction.

What I didn't quite fit in with were stories of xenophobia, colonialism, and the alienation of foreigners.

I didn't see any characters there that looked like me.

In the "Binti" trilogy, Binti leaves Earth to be educated by aliens.

She leaves the earth as she really is, unchanged in appearance, with a culture that is inseparable from her.

The inspiration for this story didn't come from the roots of classic space opera, but from the deep blood, the clash of families and cultures, and the desire to see an African girl leave on her own terms.

Unlike classic science fiction, my novels have their roots in Africa.

i am a nigerian american

I was born to Nigerian immigrant parents and grew up in America, one of the birthplaces of classic science fiction.

But it's the Nigerian blood in my blood that led me to write science fiction.

Especially in the late '90s, when my family visited Nigeria.

Since I was little, I have traveled to Nigeria many times with my family.

I was inspired by those early trips.

So the first story I wrote was set in Nigeria.

Most of what I write is magic realism and fantasy, and I'm inspired by my love for the Igbo people and traditional West African cosmology and spirituality.

But in the late '90s, I began to realize the role of technology in Nigeria, with cable television and cell phones reaching rural areas, the "Letters from Nigeria" fraudsters taking over cybercafes, and the small generators hooked up to my cousin's desktop computer, all because of the erratic power supply.

Because of the otherness of being American, the ordinary things seemed very interesting to Nigerians.

Out of that curiosity, a story was born.

I started opening doors I didn't know

What if aliens came to Lagos, Nigeria?

Read a passage from my novel Lagoon

everyone in the world saw it

That's where the great turmoil of Lagos began - Nigeria in West Africa - here in Africa.

In Lagos, a lot of people had portable, rechargeable devices -- connected devices that could light up, vibrate, make sounds, tweet, communicate -- so pretty much everything was recorded and somehow, in some way, exposed online in the blink of an eye.

The modern world is connected like a spider web

the world was watching

He pursued information as if fascinated by fear, but mostly out of amuse.

What's going on here dominates the world's headlines: video-sharing sites, social networks, circles and pyramids and trapezoidal buildings.

But the point lies deeper

In the nostalgic memories of the universe covered in mud, dirt, earth, and dirt

In the ever-intermingling past, present, and future

in the water

Among the ancestors and powerful spirits who lived in Lagos

In the hearts of the people of Lagos

change begets change

Alien Ayodel knew

all of them know

These are the words of Udide, the preeminent arachnid artist. Older than the soil, Udide lives, listens, and speaks in the depths of the city of Lagos, telling the story of an extraterrestrial being who visits Lagos.

This great spider, the size of a house, weaves a story that spans the past, present, and future, but finally emerges and decides to be a part of it.

Like this spider artist, Udide, African sci-fi runs deep in its blood. It's been around for a long time, it's always there when there's a chance, and once it's there, it's a source of new technologies, ideas, and socio-political change.

For Africans, grounded science fiction can be a will to power.

"What if it's like this?"

that's a powerful question

thank you

(applause)

Let me show you some pictures of the city of the future.

This is Kibera, the largest squattered area in Nairobi.

A squattered area of ​​Sanjay Gandhi National Park in Bombay, India, now called Mumbai.

This is Rocinha Rio de Janeiro's largest and most urbanized slum.

This is Sultanbeli, one of Istanbul's largest slums.

This is my vision of the city of the future, the new urban world.

Why?

I must introduce him to this story, his name is Julius.

I met him last week when he was in Kibera.

I stayed in Kibera for three months, and I went to explore different parts of the slums, and there was even a scene when the guy who accompanied me was wide-eyed, surprised, and grabbed my hand and asked for help.

Kenyans are a very polite and modest people.

It turned out later that day was Julius' first visit to Nairobi, the number of people moving from rural to urban areas.

It can reach 200,000 people in a single day, and he was one of them.

To the statisticians you spoke to this morning, it's not about 1.5 million per week, it's 1.4 million. I'm a reporter, so I'm exaggerating.

A rough calculation would be 130 people per minute.

In the 18 minutes that I'm here to talk to you, 2,000 to 3,000 people will move to urban areas.

Let's look at another statistic

The number of squatters today is one billion people, one in every six people on the planet.

By 2030, the number will be 2 billion, a ratio of 1 in 4.

By 2050, it's projected that three billion people, or one in three people on the planet, will be squatters.

So this is the city of the future, you can't ignore it.

I was thinking to myself this morning, "What is a good life?" But before I show you the rest of my presentation, I'd like to break the TED rules and read a little bit of my book, as briefly as possible.

I believe that a passage from this book will transform our perception of the "good life".

"Here we build shacks on concrete.

There are 10 rooms each in length and width.

Armstrong O'Brien lives with three men.

There is no running water here, so they buy tap water nearby. There are no flush toilets.

Some of the electricity was illegally sourced from other people's homes, but it was all we could do to light a little light bulb.

This is Southland, a slum in the western part of Nairobi, Kenya.

It's the same everywhere, the majority of Nairobi's population lives like this.

1.5 million people are crammed into iron huts with no gas, no electricity, no toilets, no human rights.

Armstrong described the grim situation. Monthly rent is about $20, which is quite a sum in the slums of Kenya, and late payment is absolutely unacceptable.

He said, "If you don't pay for a month, the gang and landlord will kick you out and take your belongings."

"It's a day, not a month," interrupted my roommate, Hillary, who was making ugali, a white corn flour dish that's common in Kenya.

The landlord is called a wavenji, which means someone who has enough money to drive a Benz.

By the time Hillary's dinner was on the table, the sun was shining on the thin steel roof, and I couldn't stop sweating while eating.

After dinner, Armstrong put on a tie and a wool sports jacket and hit the town.

Outside, there was a pile of garbage that separated Southland from neighboring Langata, which was not a squatter zone.

It was 2.4 m high, 12 m wide, and 3 m deep.

Dirty water was scattered around

When I passed by, there were two boys climbing this garbage mountain.

Probably around 5 or 6 years old

Every time they stepped barefoot, their feet would sink into the trash, and hundreds of flies would fly around the pile of trash.

I thought you were playing a mountain general.

No, as soon as we got to the top, one of us pulled down his pants and crouched down to defecate.

Energetic flies fly around your feet

Where 100 or so people share a single pit toilet, it's probably not a big deal to do your business in a pile of garbage.

But it's at odds with Armstrong's "I love living here."

According to Armstrong, Southland is running out of resources.

It's not bound, it's a place where humanity overflows from iron huts and mountains of garbage, and in other words, it's free.

"This place is addictive," he said.

"Life is not bound by simple things"

no one can bind me

"Once you live here, you can't go back."

"Once you live here, you can live here until you die," he changed his mind.

This is probably the most primitive slum in Kibera, like a shack next to a garbage pile.

Preparing for the monsoon in Bombay, India

The house is being reinforced. You use vinyl sheets for waterproofing.

This is Rio de Janeiro How much better, right?

There are signs on the walls, terracotta tiles, bricks, plaster, and paint. This is Sule Montakaya's house in Sultanbeli.

There's a fence, you found a door, and even the roof tiles are brand new.

And then there's Rocinha, which shows further progress.

High-rise buildings include

As you can see in the far right corner, it looks like the buildings are gradually stacked up.

If you build a one-story house or a two-story house, you sell the rights to the ceiling, and someone who buys it builds another house on top of it, and that person sells the rights to the roof, and builds another house on top of it.

The house is all made of reinforced concrete and brick.

Next is Sultanbeli, Turkey. The design here is more developed. "Next is Sultanbeli, Turkey. The design here is more developed."

What you see in the foreground is stuffed mats, which you see everywhere in Turkey.

In Turkey, mats are dried on the roof.

Look at the green building in the back. No one lives on the top floor.

The design of this house is first class.

Eventually, we'll have suburban homes like this one.

This is a squatter's detached house.

This is also Istanbul, Turkey

This area is very lively

This is Rocinha's main street, Garvia, and there are a lot of people, but buses also pass here.

Communities around here are even more vibrant than illegal immigration zones.

Various activities can be seen

This is common in Rocinha, which is called Biko.

away from rio beach

It's very steep because it's on an inland hill, and the house is supported by natural cantilevers.

it's just a rock

These streets are usually very crowded, and people carrying furniture, refrigerators, everything goes through them.

I will carry the beer manually.

Beer is essential in Brazil

This is Kenya's business. It's right next to the railroad tracks.

This is the Kenyan market, the toy market.

The green one on the ground is mango

This is Kibera's shopping district, there's a soda shop, a clinic, two beauty salons, a bar, two grocery stores, and a church, and more.

As usual, they made it themselves.

Look to the right, can you see the little letters under the shade? This is a hotel.

In Kenya and India, a hotel means a place to eat.

it's a restaurant

Power thieves are rampant in Rio

Power thieves, called crickets, steal power from cables attached to utility poles and use it in their neighborhoods.

We incinerate our garbage, and we even dig our own sewers.

Plastic bags get more attention than plankton,

Natural Waste Disposal Law

If I had the money, I'd pave the streets and install water and sewage pipes.

This is Rio's simple water system. It has its own pipes to run the water. This hut has a pump.

How do you get out of the shack stage? How can we achieve development like Sultanberi?

two things are important

First of all, I need a guarantee that I can live safely.

This is not necessarily a question of property rights, so I disagree with Hernando de Soto on this point, because property rights often create problems.

When someone takes ownership, they later create a debt that they have to pay off, and they may have to sell the ownership to pay it off.

There are many other reasons why property rights don't work in slums, but they need a safe place to live.

Second, we need greater access to politics.

Both top-down and bottom-up community formation becomes possible

Turkey has a unique law to protect slums

there are two

The first is gejekondu, which is Turkish for "night construction," because if you build a house secretly at night, you can avoid legal eviction.

Secondly, any community with a population of 2,000 can legally apply to the government for registration as a municipality.

If it becomes a basic municipality, an administration will be born

We can elect municipalities, we can provide public services like tax collection, and this is what's happening.

In other words, they are the mayors of the future municipalities.

she is gita ziwa

I live in a tent on the highway median in Mumbai.

This is Surekha Gandhi, she lives on the same highway median.

they are honest and very active

Become a leader in your community

This is neine, which means grandmother in Turkish

In the back, the handmade house, there are three old women who have been living there for 30 or 40 years, and they are the lifeblood of this community.

This is Richard Mussama Peter, a wandering photographer from Kibera.

He makes a living out of photographing the landscapes and people in his neighborhood, and he's an important part of this community.

My recommendation for mayor of Rio is this Siginho, a fruiter with two sons, and I have never seen a more honest, more altruistic, more caring person.

The future of these communities depends on our cooperation with their residents.

The message from the excerpt from the book you just read, from Armstrong and others, is that it's all about community.

The problem is urban poverty and

It's not even a pile of garbage

It's a question of whether or not we recognize squatters as communities. Future urban development is already underway. This is a form of rational urban development, and we should support it.

thank you

In the 60's I was a student. It is a time of social upheaval and problems. And, personally speaking, it was an awakening to idealism.

With the Vietnam War intensifying and the civil rights movement in full swing, I was strongly influenced by various photographs.

What politicians and military leaders were talking about was one thing photographers were talking about.

I believed the photographer, as did millions of other Americans.

Their photographs fueled resistance to war and racism.

They not only recorded history, they changed the course of history.

And when that picture formed part of our collective consciousness, and shared conscience with consciousness, change was not only possible, but inevitable.

Thus, what people were confronted with was a problem that had far-reaching, abstract or ideological, or global implications.

What's happening at the bottom is away from the halls of power and falls one by one on ordinary citizens.

We understand that documentary photography allows us to interpret events from the point of view of ordinary citizens.

It also gives voice to the voiceless.

A wish for TED. It's an important story to tell. What to expect from TED. To re-access and use new photographic techniques in the digital age in innovative and exciting ways.

thank you very much.

[October 3, 2008. the story begins. ] ["I am a witness. This photo is the testimony."] [South Africa] [This is still happening. ] [Cambodia] [Swaziland] [One person dies every 20 seconds. ] [Thailand] [An old disease is emerging in a whole new way. ] [Siberia] [Lesotho] [Tuberculosis. Is it the next epidemic? ] [India] [Tuberculosis is a preventable and treatable disease. ] [But it mutates if the treatment is inappropriate. ] [ XDR-TB ] [Extremely drug-resistant tuberculosis] [There is no definitive cure. ] [Patients often die within weeks of diagnosis. ] [49 countries have reported XDR-TB. ] [XDR-TB is a serious threat to global health. ] [Extreme Outbreak] [Extreme Suffering] [Extremely Preventable] [XDR-TB] [Stop the spread of the disease now. ] [Spread the word. Stop the spread of disease. ] [Visit XDRTB.org. ] [XDRTB.org: We're the cure. ] [Treatment by us] [Made possible with support from BD]

About two years ago, I received a phone call that changed my life.

"Hello, this is my cousin Hassan."

frozen

I have well over 30 cousins, but I didn't remember a cousin named Hassan.

In fact, Hasan was my mother's cousin and had just arrived in Montreal as a refugee.

And in the months that followed, three more relatives came to Canada in plain clothes to apply for asylum.

In the two years since that phone call, my life has completely changed.

Now that I've left academia, I'm leading a diverse group of engineers, researchers, and refugees to develop personalized self-help resources for newcomers.

I want to help them overcome the barriers of language, culture and other things that make life feel like they're out of control.

And I feel that AI can help restore the human rights and dignity that many people lose when they seek help.

My relatives' refugee experiences are not uncommon.

According to the United Nations High Commissioner for Refugees (UNHCR), 20 people are displaced every minute due to climate change, the economic crisis, social and political instability.

During my service at the local YMCA shelter where my cousin Hasan and other relatives were sent, I came to see and understand just how much effort and coordination resettlement requires.

Once you enter the country, you must first find a lawyer and fill out and submit legal forms within two weeks.

You'll also need to book an appointment with a pre-licensed internist just to apply for a work permit.

And before you can get any form of social assistance, you need to start looking for housing.

With thousands of people fleeing the United States to Canada over the past few years to seek asylum, we soon realized what it's like to have more people in need than resources to help.

Social services take time to scale, and even as communities do their best with their limited resources and try to help more people, newcomers are spending more time waiting helplessly in limbo.

For example, in Montreal, where millions of dollars are spent helping refugees resettle, nearly 50 percent of new arrivals are still unaware that there are free resources to help with everything from paperwork to job hunting.

The problem isn't that the information doesn't exist.

On the contrary, people who need help are often given so much information that they struggle to make sense of it all.

"Don't give me any more information. Just tell me what to do."

It's a word that reflects how someone who has just arrived in a new country can go through a tremendous amount of hardship without knowing right or left.

When I arrived in Montreal, I struggled with the same problem, even though I have a Ph.D.

(Laughter) A colleague on the team, a refugee himself, put it this way: "In Canada, a SIM card is more important than food, because you're not going to die of hunger."

But having access to the right resources and information can mean the difference between life and death.

Once again, access to the right resources and information can be the difference between life and death.

To address this problem, we built Atar, the first AI-powered virtual refugee helper, to guide you step-by-step through your first week in a new city.

Just tell them what you need help with

Atar then asks you a few basic questions to help you understand your unique situation, and then guides you toward the right kind of help.

For example, "Do you have a place to stay tonight?"

If you select "No," ask "Would you like a women-only shelter?"

"Do you have children?" etc.

Then a personalized, step-by-step to-do list tells you everything the person needs to know: where to go, how to get there, what to pack, and what's there.

You can always ask questions, and if Atar doesn't know the answer, he'll connect you to a real person who knows the answer.

But the most exciting thing is that what we're doing is helping humanitarian agencies gather the information and analytics they need to understand the evolving needs of new arrivals in real time.

It's going to make a big difference in helping refugees.

We've already partnered with UNHCR to bring this technology to Canada, and we've been working on this in Arabic, English, French, Creole and Spanish.

When people talk about refugees, they often focus on the official figure of 65.8 million displaced people worldwide.

But the reality is much more than that.

By 2050, an additional 140 million people are at risk of being displaced by environmental degradation.

And today, just today, nearly a billion people already live in illegal settlements and shanty towns.

Resettlement and integration into local communities is one of the greatest challenges of our time.

Our hope is that Atar will be a supporter for each newcomer.

And that Atar can reinvigorate existing efforts to help relieve the burden of already overburdened social safety nets.

But most importantly for us, this initiative will provide refugees with the resources they need to help themselves and help them regain the human rights and dignity they lose during resettlement and social integration.

thank you

(applause)

I'm from Northern Ireland, right in the far north, where it gets pretty cold.

This is me in "Midsummer" running in the backyard

- Venue (laughs) Where to work

I was undecided, and in that case I would enlist in Ireland, but honestly that would be the worst.

-At the venue (laughs) My mother wanted me to be a dentist.

constant bombing became a hindrance

In Belfast, where I went to school, a lot of things happened.

Scenes like this were commonplace

school is really boring

forced to study latin

Teachers weren't fun Sports were dirty and painful

That's where I got the idea for rowing, and I got pretty good at it.

I was rowing as a school representative, but one day, fatally, I capsized right in front of the whole school.

the goal was right there

- Venue (laughs) It's a big shame

Around this time, the dream research machine 380Z was introduced to the school with a government subsidy.

lazy students like me studied programming

Home computers these days are here

It's a 1k Sinclair ZX80 The program was sold on a cassette tape.

As an aside, it seems that to give a TED talk, you need a picture of your old ugly hairstyle.

i got this picture

- Venue (laughs)

I want to dispose of

The successor to Sinclair ZX80 is the well-crafted Sinclair ZX81

- Venue (lol) Looking at the picture below

man doing homework with boy

That was the original intention, but in reality we

With a programming manual in hand, I started making games.

Basic wasn't very good at making games, so I started learning assembly language so I could control the hardware.

It's inventor Clive Sinclair, and he's holding it.

This is the Timex Sinclair 1000 sold in the United States.

It took the imagination to think you were piloting the Battlestar Galactica.

The graphics back then were terrible.

Deathriders required even more imagination.

Engineers can't stand

I started making my own games

This is one of my favorite rabbit breeding games, and the male chooses which rabbit he likes best.

Around this time, it evolved a lot from 1 kilobyte to 16 kilobytes.

16 kilobytes is the same amount as the eBay logo.

At that time, there was someone who wrote a program for a flight simulator within that capacity.

It's like this

After years of flying in this simulator, I really believed I could fly the real thing.

This is Mr. Sinclair who announces a computer that can display color.

Known as the father of games in Europe

I'm a millionaire now, so that's why I'm laughing

Over the next 20 years, I've developed a number of games.

Representative works are "Terminator", "Aladdin", "Teenage Mutant Hero Turtles"

In England, calling them ninjas was not good for children, so they decided to call them heroes.

Personally, I prefer the Spanish version of Tortugas Ninja.

I think much better

-- (Laughter) Recently, I've been trying to reach out to the Hollywood gaming industry to not just license each other, but actually work together.

Chris told me to bring the stats.

2005 Game Market Reaches $29 Billion Year on Year --

expanding

Last year we hit a record high

Surpassing the music industry by 2008

to grow to $42 billion by 2010

43% of gamers are female

it's a lot more than you think

What is the average age of gamers?

I'm assuming you're a child, right?

actually i'm 30

Interestingly, the age group that buys the most games is 37.

So the target is 37 years old.

as you know

The media tends to criticize games as violent

In fact, 83% of games don't contain content unsuitable for young people, so it's not true

Online game statistics

Involved in the operation of "World of Warcraft"

5.5 million players $80 million monthly registration fee

It's $50 to install, so that's another $275 million for the company.

It's $80 million to make, so I'll pay you in a month.

In a game called "Project Entropia," someone bought an island for $26,500.

not a real island

It's just data without substance

but got a lot of rights

Mining rights, hunting rights, island-wide sovereignty, and castles, though they're unfurnished.

- The audience (laughter) This market is estimated to be over $800 million a year.

Interestingly, this market was created by gamers.

I figured out a way to trade items and buy and sell accounts so that I could make money playing.

I searched eBay by game name to find out what's going on, and got 6000 hits.

My favorite is the epic level 60 Warlock for $174,000.

I know you worked hard to raise it.

Talking about the popularity of games, what are you doing?

In fact, I'm at the Hollywood Bowl in Los Angeles watching game music played by the LA Phil.

It is like this

You think it's cheesy, but actually

A solemn and beautiful concert

the audience was fascinated

these people

I bring my computer and play games against each other.

It is a sight that can be seen all over the world

It's done in your hometown, but you just don't know it.

I introduced a video from a few years ago, which summarizes the trajectory of the evolution of game graphics.

Today I will show you the latest version of that video.

try to understand

Drawing an upward curve, the graphics have evolved dramatically

I will show you the trajectory up to 2007

I want you to think about what games will be like in the next 10 years.

I'll stream the video

(Video) Throughout history, people have always played games.

As human intelligence and technology have evolved, so have the games.

(Music) (Applause) (David) Don't just look at the graphics, think about how they look.

Please keep in mind that this is an achievement so far and it is a transitional period for further development.

You need these graphic design skills to get a job in today's games industry.

Need an outstanding artist

I want to gather a lot of such people and discover artists who can create unknown worlds and unknown characters with a rich imagination.

I chose graphics and music for this theme.

At game developer conferences, things like sensibility, purpose, meaning, understanding, and feeling are being discussed.

It's a discussion like 'Can a game make people cry?'

There's actually a lot of interest in that sort of thing.

I had a student who was really good at self-expression, and he promised me that he wouldn't let anyone see this video until I showed it at TED.

i would like to show it

It's a collection of his thoughts on the experience of playing games.

(Video) Like many people, I live between reality and games

A human being who lives in the real world, but is being programmed, mechanized, and virtualized.

The boundaries between reality and virtuality finally began to break down in my brain

This is the story of me who became addicted to games

(music) The year I was born Nintendo also made great progress

I played in the backyard, I studied, I even ate some vegetables

When I was a kid, I used to play with Lego a lot.

Our generation spent a lot of time watching TV.

Mr. Rogers, Walt Disney, Nick Jr., and the vast amount of commercials that must have inspired him.

Given Nintendo's original console, the inherent addictiveness of interactive electronic games instantly captivated me.

Something clicked me before I knew it

(Music) Simplicity Interactive storytelling Combined with the warmth of television, early 16-bit games became more than just a pastime.

The new world of virtual reality

(Music) I'm a game addict, not because I spend hours playing games or staying up all night to raise my level

It's because games have affected our ability to make big, life-changing experiences in virtual space and discern what's real and what's unreal.

I'm addicted, I know I'm losing my sense of reality, but I can't quit

(music) From an early age, I became emotionally attached to the scenes projected on television.

It's been 20 years since I've been watching TV that's calculated to stir up emotions.

I'm just a member of the generation that grew up that way

This is the generation that experiences much more in games than they do in the real world.

Games are evolving by leaps and bounds, and the world of games is becoming as real as movies and news.

There is still a limit to the freedom you can experience in the virtual world, but what you have gained will also be applicable to the real world.

If you play a lot of games, you'll feel like you can actually snowboard, fly an airplane, drive like F1, and kill people.

i think i can

Unlike the pop culture of the past, we can be part of the game

Two-way communication, downloading, streaming, high-definition video.

We and the game influence each other

This is the level I've been waiting for

Poverty, war, disease, and genocide run rampant in the real world, which without games lacks the comfort it should.

Elements like that can be seen in primetime bombastic dramas.

The greatness of today's games is not realistic graphics, vibration controller surround, etc.

It's starting to turn me into an emotional person

Fighting on the battlefield, being frightened for survival, seeing your comrades die in the sandy beach or in the woods, feels more real than textbooks and news.

the creator is calculating

Fear Excitement Panic Pride Sorrow

Add depth to your creative world by stirring up emotions

A well-made game draws the player into the virtual experience in a natural way

The more you play the game, the weaker your bodily sensations become.

I know my will and follow it

A world with no buttons or controllers, just me and the game

My destiny and the destiny of the world I live in are all in my hands

My mother is worried about violent games

What scares me is not that the violence in the game world is getting closer to reality, but that the violence in the real world is getting closer and closer to the game.

(music) It's all a problem outside of me

But I have a more painful problem

something is going on in my brain

(music) Maybe some part of the brain controls the instincts we don't even think about.

Some of our instincts are innate, but most are acquired, all wired into the brain.

These instincts are essential to survival in the real and virtual worlds.

Thanks to technology, it's only recently that there's a real match between stimuli in the brain.

We gamers live in the same city under the same laws of physics, accumulating the same experiences as in real life, but in virtual space-

The distance I've driven is 25,000 miles in real life

31,459 total miles in the game world

In a way, you could say that I learned how to drive through games.

The feeling of driving is almost the same

It feels strange that I spend more time doing something on screen than I do in real life.

When I drive while watching the sunset, I think it's as beautiful as the scenery in the game

My virtual world is perfect

Because it's more beautiful and rich than the real world

I'm not sure what my experience means, but I'm horrified when I think of the potential applications of games that repeatedly provide realistic stimulation to large numbers of followers.

Modern rulers should be able to brainwash the masses much more easily with games than with regular television.

Games are fun and engaging, they make your brain susceptible to brainwashing

Brainwashing may not always be bad

A game that teaches mutual respect A game that deepens your understanding of real-world problems It could be

can have a positive impact

As the virtual world mirrors the real world, it is important that game developers realize their enormous responsibility.

I have no idea what tomorrow's game will bring to this civilization.

As the experience of the virtual world and the real world become closer, the possibility that other people will feel the same way as I do becomes more and more likely.

I've finally realized that beyond the graphics, the music, the gameplay, the emotions, what fascinates me and makes me addicted is the power to shatter reality.

I'm losing my sense of reality

I'm just looking at it

I know, no matter how great a game comes along, no matter how corny the real world looks, we should be mindful of what the game brings us and how we feel when we're done.

(Applause) (David) Great.

(Applause) It's a very provocative video, and that's why I wanted to show you.

Interestingly, I naturally chose graphics and sound as my theme.

Michael also talks about other themes

The impact of games is enormous, and that's why it's addicting.

the most important thing is that it's fun

Creating the "next magic"

who?

Are you a famous director? also?

no

Children who are just growing up now, not adults who are stuck in past experiences, use the tools we have created

I will create my own

Researchers, wonderfully creative people, even writers.

Speaking of colleges, there are about 350 colleges around the world that offer gaming-related classes.

there are literally thousands of new ideas

There are bad ideas and there are great ideas.

There's nothing worse than a bad game idea.

- The audience (laughs) (Chris) Yes, it's over

time is up

(David) Just a little more, if you don't mind.

Chris: Okay, but I'm here.

- The venue (laughs) It's a nice sight. Students gathered after class.

I'd come back in the middle of the night when the school was closed and come up with ideas for the game.

I sit in the front and the students exchange ideas.

It's usually hard to recruit students, but it's possible.

This is my daughter, Emma, ​​who is 1 year and 5 months old.

I ask myself, "What will Emma experience in the game world?"

As I explained, there are many enthusiastic game fans.

What Emma sees is not a world without games, but a world where everyone plays games.

I have the technology

The graphics of the world she sees are captivating and wonderful.

As that video shows, it can shock and impress.

I'm sure the game will shake her heart and make her tear up at times.

I hope you just like the game

- Venue (laughs) It's the end

At first glance, games are just entertainment, but when you think a little deeper, new paradigms in gaming have the potential to break new ground and generate ambitious creativity.

TED evokes that spirit.

thank you

(Chris) It was a great talk.

Hi I'm Jack Transgender

Guess what's in your head right now

"Transgender?

wait, is this guy really a man? Or a woman? ”

"Has this man already had surgery?

Oops, my eyes go to my crotch

That's bad, let's shift our gaze to the right."

"Oh no! Your butt isn't manly."

"My friend's daughter is transgender. Do you know her?"

"Wow, you're so brave

You support his right to use the men's restroom.

But how are you going to use it?

what about sex ”

Okay, before I get offended by the risqué content, let's stop asking delusional questions.

Don't get me wrong, I'm going to tell you about my personal experience as a trans person, but I didn't wake up this morning and want to tell the audience about my sex life.

Of course, that's also a transgender issue, right?

A lot of people worry about what parts of our lower bodies we use to have sex.

being transgender is awkward

It's not just because the gender you were assigned at birth doesn't match your actual gender.

It's troublesome because everyone else feels awkward around me.

I, and other people who wholeheartedly support transgender people, are so afraid to say the wrong thing, so embarrassed that they don't know what to do, that they don't ask questions.

I'm nervous about coming out as transgender because I know people won't understand what it means.

If you come out as gay, people will understand you, but if you're transgender, even after you've explained yourself, misunderstandings can make people look at you with colored glasses...

That's why we have to keep enlightening.

When I came out, I sent a 10-page encyclopedic document with video and music computer data to everyone I came out with.

(Laughter) I kept it in my email signature for the next few months, because coming out doesn't stop.

I came out to the tax accountant who helped me with the tax procedures, and I came out to the security officer who was confused about whether men or women should be examined.

Also, I'm coming out to everyone viewing this.

When I came out to my dad, he was totally calm about it, and I was really relieved.

It quickly dawned on me that my father, like many others, thought that transsexuals meant only one thing: surgery.

Now listen, if there was a magic surgery that could make me taller and more muscular and make me the universally recognized perfect man overnight, I would immediately sign a consent form.

Unfortunately it's not that simple

There are many different gender reassignment surgeries, ranging from breast surgery to butt surgery to facial feminization surgery to masculinization surgery.

Many transgender people only go through the procedure once, if at all.

Partly because I don't feel the need to do it myself, but the surgery is expensive and health insurance is just starting to cover it.

For transgender people who want to change their gender, the first thing they do is usually not surgery, but hormone replacement therapy.

Hormones have made my voice lower, I've grown a beard around my neck, and I have a big pimple on my chin.

It's basically like starting puberty all over again...

But it is amazing

(Laughter) It can be a little confusing when to call you by a new name, when to use he or she, because the actual gender change is more gradual and harder to notice than you might think for some time.

There is no clear-cut moment in transgendering when a transgender person becomes their true gender.

When they start using their new name or another pronoun, it's time for you to start using it.

It can be difficult to change

I may be wrong from time to time, and I have been wrong with other people.

But I always think in my heart that if I can change my name from Puff Daddy to P. Diddy and say "he" to someone's pet cat, I can do the same for the people I interact with on a daily basis.

Now, the topic that makes transgender issues most troubling is that of public restrooms.

Yes, toilets are the latest political flashpoint for LGBT enemies.

Here's an interesting story about restrooms: more men have been convicted of assaulting public restrooms than transgender members of parliament.

(Laughter) Actually, we fear you more than you fear us.

When to start using which toilet is a big point of contention in our community, so as not to attract attention that could lead to assault.

I myself started using the men's restroom when I started getting suspicious and intimidating stares in the women's restroom.

So I often choose not to go to the bathroom.

A 2015 national survey of transgender people found that 8 percent of us had a urinary tract infection in the past year as a result of avoiding going to the bathroom.

Toilet bills don't protect us as a single person.

The bill just makes it clear that reporting transgender people who are assaulted in the bathroom no longer has the law on their side.

Being transgender means being under a daily onslaught of misunderstandings.

i'm still better

As a white, able-bodied male, he's pretty privileged.

It's much harder for nonbinary people, trans women, and trans people of color.

So I've provided a basic set of transgender knowledge to help you better understand.

talk to transgender people

listen to us

spread our voice

Please lighten the burden and enlighten others so that we don't have to explain every time.

Maybe one day I'll be like, "Hi, I'm Jack Transgender."

thank you

(applause)

I've been thinking that there is

I think I'm going to kill my father

I called my sister

"Listen, I've been thinking about

i decided to kill my dad

I'm thinking of taking my daddy to Oregon to get some heroin and give it to him."

My Dad Has Frontotemporal Dementia - FTD My Dad Has Frontotemporal Dementia - FTD

Diseases affecting people in their 50s and 60s Symptoms are diverse

Illness can completely change a person's personality, make them suspicious, even violent.

My father had it for 10 years, but three years ago it got worse and we had to move him out of our home, the house I grew up in, the house he built with his own hands.

My father, who was strong and handsome and had a falsetto voice, had to move into a 24-hour nursing home. He was just 65 years old.

First, my mother, my sister and I made the mistake of putting my father in a regular nursing home.

It was a really charming facility, with deep carpets, art classes in the afternoon, and a dog named Diane.

One day I got a call

"Mr. Malone, I'm restraining your father."

"What's that?"

"Well, my father threatened everyone with a knife.

And he pulled the curtains down and tried to throw the potted plant out the window.

On top of that, they dragged all the women out of their wheelchairs.

"All women?"

(Laughter) "What a crazy thing."

(Laughter) After he was kicked out of there, we put him in various state-owned facilities, but eventually we found a treatment center for people with dementia.

At first he seemed to like it, but after a while his condition deteriorated, and one day I went to visit him, and he was sitting slouched on the ground in a coverall, with a zipper down the back.

I watched him for about an hour as he tugged at it and managed to get it off.

The clothes, which were supposed to be practical, looked like a straitjacket to me.

I can't stand it anymore

I left my father there

I crouched in my father's truck that used to be my father's, and I cried like I was squeezing it out of my stomach.

I couldn't believe that my father, the ideal man for me when I was young, the friend I truly loved, still felt worth living in this situation.

We are programmed to prioritize productivity

So when a person, in this case the ideal man, is no longer the productive person we expect him to be, what value is there in life?

In the truck that day, my father was being tortured, and I could only see his body as a vessel for torture.

I gotta get my dad out of that body

I have to get him out of my body, I'm going to kill my father —

i will call my sister

"Beth" and sister

"You don't want to live the rest of your life feeling like you're a father killer, right?

And I think I'll get arrested, because my dad can't show consent.

And you don't even know how to buy heroin."

(Laughter) I don't know for sure.

(Laughter) We actually talked a lot about my father's death.

when will that happen? How will you die?

But I wish we could have talked about death while we were all well.

What would be my best way to die?

What would be your best way to die?

But my family never thought of doing that.

And it was just as my sister said

I couldn't kill him with heroin, but I needed to get him out of that body.

so i went to see a medium

I also visited pastors and support groups, and they all said the same thing: "When you worry about your loved ones, your family will cling to the straw.

But tell me this: It's okay, you can leave when you think it's okay."

i went to see my father

My father was sitting slouched on the ground in his overalls.

My father seemed to be staring at something on the ground beyond me.

I handed my dad a ginger ale and we started rambling, and as soon as we were talking, my dad sneezed on the ginger ale.

The sneeze made my father jump up, and it was like he came back to life just a little bit.

Then my father drank and sneezed and revived over and over until he stopped.

Then I heard, "Heh heh heh heh heh...

this is pleasant

I'm really happy."

My father opened his eyes and looked at me when I said "dad"

My father also said, "Hi Beth."

I opened my mouth and tried to say

"Papa, if you want to die, you can die.

we're fine"

But the words that came out of his mouth were, "Papa!

I was lonely and wanted to see you."

Then my father said, "So do I."

So I was distraught and crouched in place.

I sat down with my father, because for the first time in a long time he looked so clear.

I carved my father's hand in my memory, and I was so grateful that his body still had his heart.

In that moment, I realized that I don't have to carry everything on my shoulders.

I'm not my father's doctor, I'm not my mother, I'm definitely not my father's God, and perhaps the thing that's most helpful to him and me is to return to the role of father and daughter.

So we sat there, quietly and calmly, as we used to be.

no one is productive

we are both still strong

"Then Papa, let's go. I'll come see you tomorrow."

"I understand," said the father

"Hey, this is a very nice hacienda."

thank you

(applause)

What I'm going to talk about now is climate and its variability, but it's not about polar bears, it's about humans.

This is the house our family lived in in the mid-2000s.

I was the chief operating officer of an organization that provided weather and marine information for the Navy.

The facility was located downstream from the Stennis Space Center, facing the Gulf of Mexico. We lived in the small town of Waveland, Mississippi, and our house was modest but comfortable, and, as you can see, was built on stilts to protect against storm surges.

Have you ever wondered what would happen if a 30-foot or 9-meter storm surge hit your house? let me show you

It's the house from before

this is me

There's an expression, "I'm homeless," and this time it was just after Hurricane Katrina, and my house was either over there on the railroad tracks or on the other side, somewhere in the Gulf of Mexico, and I'm still literally homeless.

where have you been

(Laughter) It's really gone.

I'm not showing it for pity, because in many ways we're the luckiest people in the Gulf Coast.

The first point is that I had insurance, and the idea of ​​having insurance is probably very important in a situation like this.

By the way, are these disasters going to get bigger?

I think it will probably, because as we all know, as sea levels rise, even weaker storms can do this much damage.

Let's look at this issue a little more objectively.

As you know, the climate is very complex and there are many factors involved, but I want people to know that water is a very important factor.

Look at the three blue circles at the bottom of the screen

The most prominent circle represents all the water on earth.

The two smaller circles represent fresh water.

We know that the distribution of water is fundamentally changing as the climate changes.

Too much, too little, not the right place or time

There's salt water where it should be fresh, liquid water where it should be frozen, water where it should be dry, and indeed, even the chemistry of the oceans is changing.

And that has three security and military implications. It changes the environment in which we conduct military operations, it threatens our military bases, and it creates geostrategic risks.

Let's look at a couple of examples

First, as you all know, of course, I'll start with an example of a political and humanitarian disaster, namely Syria.

It turns out that climate played a part in a series of events over the years.

In fact, it dates back to the 1970s.

When the Assad regime took control of Syria, it thought it should be self-sufficient in things like wheat and barley.

In Assad's office, you probably wish someone had said, "Boss, it's a bit dry here on the eastern Mediterranean, so I don't think it's a very good idea."

But in reality it was like, "You're smart, you're powerful, you're handsome. I'll get to it."

and put it into action

And then, incredibly, by the '90s, we were becoming food self-sufficient, but at a great cost.

Wasted both groundwater and surface water

Of course, there were many factors other than climate in the Syrian problem.

It's the Iraq War, and as you can see by the blue line at the bottom, over a million refugees flooded into the cities.

And then about 10 years ago there was a terrible heat wave and a drought that left its mark all over the Syrian problem, yes, it's related to climate change, and it forced about 800,000 more farmers into the same city.

Why? because i lost everything

There was only dirt and dust, nothing else.

Today, farmers and Iraqis live in urban areas, and because it's Assad, they don't care about their own people. And suddenly things got serious.

So within the security community, we see climate change as a destabilizing risk.

It's also a factor in accelerating instability in Syria.

Put simply, things are getting worse and worse.

See other places

We're heading 2,000 kilometers to about 1,200 miles north of Oslo, just 1,000 kilometers from the North Pole, which is probably the most strategically important island, but you don't know it.

A place called Svalbard

It's positioned so that the Russian Northern Fleet straddles the sea lanes that go out into the open sea and sail into warmer waters.

Because of its geographic location, it's also a place where you can control all the polar orbiting satellites in their respective polar orbits.

So it's a strategic advantage in using outer space.

Due to climate change, the sea ice in this area has decreased and human activity has increased significantly, making it a volatile situation. In fact, NATO parliamentarians are scheduled to meet here in Svalbard next month.

Russia is very dissatisfied with this

So if you're looking for sparks of conflict in the Arctic, look to Svalbard.

Now, within the military, there's something we've understood for decades, if not hundreds of years, that the time to prepare is before it happens, whether it's a hurricane or a typhoon, or a strategic reassessment.

It's time to start preparing

Luckily, Secretary of Defense Mattis understands this very well, and he understands well that the environment is a risk factor.

He wrote this to Congress, and verbally said, "It's my job as secretary of defense to manage these risks."

The US military isn't the only one who understands this.

Many of my friends and collaborators in navies and armies in other countries also have very clear views on climate risk.

In fact, at a half-day seminar at the International Seapower Symposium in 2014, I had the honor of speaking on this issue to 70 naval representatives.

Winston Churchill is credited with saying - I don't know exactly what it is - that Americans always do the right thing, but only after they've done everything else.

(Laughter) I think we're in the process of trying all the possibilities, but I think it's going to work.

But I need your help

this is my request

So instead of asking you to put out your recyclables on Wednesday, I want you to talk to every business leader, technology leader, political leader, and ask them, "What are you guys doing to stabilize the climate?"

that's all

Because if as many people as possible were genuinely interested, politicians would hardly ever be at the forefront of solving problems, but they would be able to make a difference by being led by someone else.

What's certain is that the ice doesn't care

who is president of america

Which party is ruling in Congress

It doesn't matter who is the ruling party in your country

it just melts

thank you

(applause)

When I was four years old, my father introduced me to the Taos Pueblo hoop dance, a traditional dance that originated in the southwestern United States hundreds of years ago.

A series of hoops are made from willow wood, and these hoops are combined to give the universe a different shape, representing the different beauties of life.

This dance moves at a constant speed, mimicking the movement of the sun and the passing of time.

This dance got me hooked

It was like a time capsule, a glimpse into the past through a cultural window.

I felt a deep connection, a connection to the worldview of my ancestors.

Since then, I've been obsessed with time capsules.

They come in many different forms, but what they all have in common is an irresistible fascination for us humans, because time capsules are gateways to memory, and they have an important ability to keep stories alive.

As a filmmaker and a composer, my ongoing journey has been to find my voice, to recapture my heritage, my stories from the past, and bring them together in a time capsule in the form of music and film to share with people.

To tell you how I found my voice, I'd like to tell you a little bit about my background.

I grew up in a multi-generational home in Southern California, where my parents, my uncle, my grandparents lived together under one roof.

My mother was born to Dutch-Indonesian and Chinese immigrant parents, and my father was an Ojibwe Native American member of a registered tribal member of the Prairie Band Potawatomi, a tribe in northeastern Kansas.

So I learned how to wrap dim sum one weekend, and the next weekend at a powwow gathering, I learned to dance traditionally, getting used to the powerful sounds of drums and singers.

Being surrounded by multiculturalism was a normal and confusing experience.

Finding my own voice was very difficult, because I never felt like I was Chinese enough, or Dutch-Indonesian, or Native American.

I didn't feel like I belonged to any society, so I tried to rediscover myself by learning and piecing together stories from our cultural heritage.

Music was the first way I felt I had a voice of my own.

By using multiple layers of sound and multiple instruments, I was able to create much larger worlds and soundscapes than ever before.

Through music, I would like to invite you to the portal of my memories and emotions, and to reflect your memories and emotions.

One of my favorite instruments to play is the Guqin, a Chinese harp-like instrument.

While hoop dancing is hundreds of years old, guzheng has a history of more than 2,000 years.

I play music styles that have had a big influence on me today, such as electronic music, on instruments that were once used in traditional folk music.

And I've noticed an interesting connection: the guzheng is tuned to a "five-tone scale," which is widely known in many genres of music around the world, including Native American music.

Whether it's Chinese folk songs or indigenous music, I feel this unique resonance of longing and clinging to the past.

At that point, I thought, maybe I could enhance this sense of unity even further by layering video and audio, and putting video and image on top of music.

I learned software editing online, and in college I went to a local college to save money and make films.

After a few years of experimental production, when I was 17, I encountered something that I wanted to tell and leave behind.

It started with one question: "What happens when the story is forgotten?"

That question led me to direct and direct my latest documentary, "Smoke That Travels," which draws you into a world of music and song, color and dance, while also delving into the core of my uniqueness: my fear of forgetting my ancestral Indigenous identity.

Many indigenous languages ​​are being lost because of past assimilation policies.

From the late 1800s to the early 1970s, indigenous peoples were forced into boarding schools, where they were violently punished for practicing traditional customs or using their mother tongue — mostly by word of mouth.

There are now 567 federally recognized tribes in the United States, when there used to be countless tribes.

In the words of my father, "Indigenous identity is not about having long braids of hair.

I'm not talking about feathers and bead embroidery

Whether we can all, as human beings, place ourselves at the center of the world.”

I traveled around the world with this film for over a year, meeting indigenous people from all over the world, including the Ainu in Japan, the Sami in Scandinavia, the Maori, and many more.

And it turned out that all peoples had exactly the same big challenge: to protect their language and culture.

I am now aware of the power of stories to unite us all, and I am also aware of the responsibility that comes with this power.

If the story is rewritten or neglected, it can be very dangerous, because if you deny your identity, you become invisible.

we are all storytellers

If we take back our stories and listen to each other for a moment, the act itself can be a clue to transcending time.

thank you

(applause)

I have five brothers, all of whom are scientists or engineers.

A few years ago, I sent an email to everyone saying, "I hope you're doing well, brothers.

Today, I would like to inform you that I am dropping out of my master's degree in engineering to pursue a career as a musician.

Please don't worry."

Brother #1 replied

They supported me, but I was a little cautious

My brother replied, "I wish you luck.

You'll need some luck."

(Laughter) Brother number two was more careful.

He replied, "Stop!

It's going to be the worst choice of your life.

Get a decent job

(Laughter) The other brothers were so impressed with my determination that they didn't even reply.

(Laughter) I know that because people care about me and worry about me, it makes me more cautious.

I was worried

My brothers thought it would be difficult for me to make it as an artist and it would be a big challenge.

And it turned out just as my brothers expected

It's really hard to make a living as an artist

I have a lot of friends who have side jobs to pay their bills, but sometimes the side jobs become their main jobs.

I and my friends are not alone in this experience.

According to the U.S. Census Bureau, only 10 percent of people who graduate from art school become full-time artists.

The other 90 percent change course and go into other careers, such as marketing, sales, or education.

It's a common story, isn't it?

Because everyone assumes that "artists don't sell"

But why do you decide that?

Four years ago, the EU launched the world's largest art funding system, according to an article in the Huffington Post.

The program, called Creative Europe, will grant $2.4 billion to more than 300,000 artists.

Meanwhile, the federal budget for the National Endowment for the Arts, America's largest art grant, is just $146 million.

Let's look at the bigger picture: the budget of the US military band alone is almost double the total budget of the National Endowment for the Arts.

In addition, Brendan McMahon's article in The Huffington Post makes a striking explanation: out of the $1 trillion defense and military budget, if only 0.05 percent was devoted to the arts, we could run 20 full-time orchestras that would cost $20 million to operate, and we could pay all 80,000 artists $50,000 a year in salaries.

If you can do this with just 0.05%, what can you do with 1%?

Now, in the capitalist society we live in, it's certainly profit-driven.

So let's think about it from an economic point of view.

The non-profit art industry in America generates more than $166 billion in economic activity, supports 57 million jobs and generates $12.6 billion in tax revenue.

But it's all about the economy, right?

As we all know, art has far more than its economic value.

art gives meaning to life

soul to the culture

A foundation that connects people and supports creativity and social cohesion

But if art contributes so much to the economy, why is investment in art and artists still so low?

Why are more than 80 percent of all schools across the country cutting budgets for arts education programs?

What are the values ​​of art and artists that we don't yet understand?

I think the system is flawed and totally unfair, so I want to change it.

I want to live in a society where artists are valued more highly, where artists are more culturally and economically supported, where they don't have to drive Ubers or work for companies they don't want to do, but where they can focus on creating their work.

But there are other sources of income for artists.

There are private foundations, grants, private patrons who give money, but the vast majority of artists are unaware of these opportunities.

On the one hand, there are groups and individuals with money,

On the other hand, there are artists who need money, but artists don't know about people who have money, and people who have money don't necessarily know about artists.

So I'm really happy to have the opportunity here to introduce you to Grantpa, a technology-enabled online platform that introduces artists to grants and financial assistance in a quick, easy, and affordable way.

Grantpa is just the first step in solving the current problem of funding inequality.

Do you see art as a luxury or as a necessity?

Do we really understand an artist's day-to-day life? Or do you still think that no matter how hard an artist is, they should be happy because they love and are passionate about it?

In the next few years, I plan to send my brothers an email saying, "Hey brothers, I hope you're doing well.

I am writing this email to let you know that hundreds of thousands of artists, myself included, are doing well. Culturally and economically, our reputation is growing day by day.

Thank you brothers for your support

Thanks to everyone."

thank you

(applause)

Let me take you to my hometown. See a photo of the town from the week Emergence was published.

This is a photo that everyone has seen many times

Emergence was published around the time of 9/11.

I live around here in the West Village, and luckily the smoke was blown away from us by the west wind.

There was a two-and-a-half-day-old baby at home, and I didn't kidnap him.

(Laughter) And at the same time that these two things, the book and the baby, came into existence, this incident happened very close by. I saw the scene from my apartment, and then I went out into the street and looked up at the building from my front door.

The book celebrated the power and creative possibilities of human concentration, especially concentration in big cities, that is, people connecting, congregating in one place, like a roadside, sharing ideas and physical spaces.

Looking at the buildings that burned and collapsed, I realized that when two towers burned and collapsed and people were really concentrated, there would be a lot of deaths.

It's the technology that created the turmoil, the technology that made it possible for 50,000 people to live in two buildings, 110 stories above ground, that caused a great toll.

If it wasn't so crowded...if you compare the number of lives lost at the Twin Towers to the Pentagon, you can see that clearly.

And I started thinking, what is people's focus, what is focus? I wonder if it was right that I was attracted to concentration

I've been thinking about this for a few days

After two days, the wind started to change a little and I felt that the air was not good.

The West Village, where I live, hadn't even had a car yet, but my wife told me to go get a big air filter at a hardware store about 20 blocks north.

and i went out

As you can see, I'm a tough type of body (Laughter), so I was pretty confident about carrying 20 blocks.

When I went outside, something truly miraculous happened. As I was walking north to buy an air filter, the town came to life with people.

It was an unbelievably beautiful day, about a week after the incident, and the West Village looked more alive than ever.

I was walking down Hudson Street. Jane Jacobs lived here and wrote a great book.

The people who lived in the neighborhood, the people who ran restaurants and bars, they were all out.

people were out

I didn't have a car, which was even better.

It was a beautiful city day. It was amazing how the city worked.

the city was there

Everything that makes a great city thrive Everything that makes a great city come to life was there right there.

I thought yes, this is the power of the city.

Cities are talked about as urban forces, as spatially concentrated places, but most of the time, the reason cities are resilient is because they are functionally distributed.

Cities don't have centralized enforcement agencies that, if extracted, would all fall apart.

If there was, it's probably here at Ground Zero.

As you know, there was also an emergency shelter, but it was destroyed in the attack, causing great damage to buildings and lives.

And yet, just 20 blocks to the north, after two days, the city couldn't have been more alive.

If you look into people's minds, there must have been a lot of trauma, a lot of anguish, and a lot of things that took a long time to recover from.

But the city system itself worked.

I got the courage to see this

I want to talk about why cities work so well and how those reasons relate to where the web is headed.

After I talk about my book, I often ask people this question: When people talk about the behavior that emerges when people gather together, when people talk about collective intelligence, it's a good way to get people to think about it. Who makes a district? ask

Who made SoHo such a personality? What is the vibe of the Latin Quarter?

It's probably some kind of executive decision, but for the most part the answer is "everybody" or "nobody."

everyone contributes a little

No one person is the ultimate driving force behind the character of a neighborhood.

Who enlivened the streets in my neighborhood after 9/11? is a similar question

This answer was also city-wide

The whole system worked, everyone contributed a small role.

This is something I started seeing on the web in a number of interesting ways, and when I wrote and published Emergence, there really wasn't anything else around that was very experimental.

I think it's been a very optimistic time so far, and I'd like to talk a little bit about that.

Essentially new interactivity is emerging online right now.

It used to be like this

This is not the future King of England - although it looks like it

Here's a guy I found on the GeoCities home page, and the links below are football, Jesus, Garth Brooks, Clint Beckham, and Hometown.

It captures the zeitgeist of the Web in 1995, and the best way to describe the model of interaction that was so exciting at the time is, "Click here for a picture of my dog."

I don't think there's a better sentence to remind you of this era, suddenly you have the power to put a picture of your dog online and link to it, and someone reading this page has the power to choose whether or not to click on this link.

I'm not trying to disparage this, because, referring to what Jeff was talking about yesterday, this interface has sparked a certain kind of frenzy, and it's led to an explosion of interest in the Web, where you put up a link and someone clicks, and it takes you anywhere you want to go.

But this is still a very one-to-one relationship.

One person puts up a link and another person decides whether or not to click on it.

The new model is more like this, although it's been mentioned here and there.

A Google search for “Steven Johnson” yields this

Two months ago, I made a breakthrough. It's a dizzying feat. Searches for "Steven Johnson" put my website at the top of the list.

There was Steven Johnson, a theoretical physicist at MIT, and I'm happy to say he's dropped two places.

(Laughter) Let's take a look at some similar examples, and clearly Google is the best self-discovery technology ever invented.

In my search for myself, I find that there are many others.

What's really going on here is how I'm building this page -- everyone knows this, but it's worth thinking about -- nobody decides that I'm the best answer to Steven Johnson.

This collective decision-making is taking place.

This page was essentially created by the Web as a collective, and Google is just helping to make this decision by creating a place to source information in a consistent way.

Some things are more innovative -- Google is innovative enough, but they're adding more innovation.

This really interesting new site is Technorati, it's full of little widgets, and they're growing.

And from here you can take a peek into the world of blogging.

Analyzing all tracked blogs

It's counting how many links you have from another blog, and what you're seeing here is that blogs with more backlinks are more authoritative than blogs with fewer backlinks.

And at any given time, for any page on the web, what is the blog's reputation for this page? when asked

will give you a list

It shows what people think of my site and ranks the authority of the blog.

You can also rank them according to how recent they were written.

As I wrote in "Emergence," one-way link structures have their limitations. In fact, when you link to someone else, they don't necessarily know that you've linked them to them.

This is one of the reasons why the Web hasn't been as new as it's potential. Without feedback mechanisms like two-way links, it wouldn't have been possible to do really interesting things.

Search engines like Technorati provide it

And here's an interesting quote from Dave Weinberger, who said that everything on the web has a purpose, that everything is man-made.

And if you put up a link -- if you put up a link, it's because someone decided that

A link to a site doesn't occur naturally, unlike mushrooms that grow on trees.

Actually, I don't think this is quite right now.

I can put all the links that Technorati creates on the right side of my page, and that changes as the entire web ecosystem changes.

Small list here changes

i have no direct control

In a way, it's more like a data mushroom wrapped around the page than the intentional link I put here.

What you have here is basically a global brain, and you can do all sorts of experiments to find out what that brain is thinking.

this is a very interesting tool

Google looks at search requests in Google Zeitgeist and publishes a bunch of interesting graphs about what's happening and where people are going.

I've had a lot of praise for Google, but I have one critical thing to say.

Google Zeitgeist has a problem where it repeatedly shows news that many people have searched for, like pictures of Britney Spears, things that aren't news.

When the Columbia explodes, suddenly there are more searches for the Columbia.

This can be assumed

It's not necessarily something you didn't already know

So what's important about these new tools is that they're like tubes that connect deep into the global brain, and if you inject a little bit of dye throughout your bloodstream, you can see [connections].

I did an experiment with Google Share where I used an abstract word, Googled that word, and then googled that search result for a person's name.

So the percentage of pages that mention that person's name out of the number of pages that mention that word is the Google Share for that person's word.

you can run interesting contests

For example, this is the Google Share for "TED Conference"

Richard Saul Wurman owns about 15% of Google Share of "TED Conference"

Our Chris is about 6%, the red circle is soaring.

(Laughter) If you expand your search a bit, you'll find something interesting.

42% were actually sunfish.

I don't know why

No, to tell you the truth. (Laughter)

I just wanted to put a sunfish on my slide.

(Laughter) I also did this experiment -- I don't mean to quarrel, but I did a Google Share analysis of evolution and natural selection.

And here are the results -- a big category, so a small percentage -- Dan Dennett's 0.7% -- he's going to give a talk soon.

Next is Stephen Pinker at 0.5%

Dennett has a little lead

Interesting things, you can broaden your search and find interesting things and see what's out there.

Gary Bauer isn't far behind, he just has a slightly different theory about evolution and natural selection.

Right next to it is L. Ron Hubbard (founder of a new religion).

Chris, it would be nice to have a panel discussion with these members.

(Laughter) Hubbard wants to speak at TED, maybe next year.

One more thing, this is a little bit different, but some of you may have seen this analysis.

It's just been published, and it's a search of historical records of State of the Union addresses for words that have burst into use.

These words just popped up out of nowhere, and they're like memes that started to spread, and they weren't used that much before.

The first one, a term that exploded in the 1860s, was slavery, emancipation, slavery, rebellion, the Kansas.

―That's the name of a song by Britney Spears.

In 1860, slavery was being talked about.

1935—Bailout Depression Recovery Bank

ok nothing new it's obvious

1985, in the middle of Reagan's presidency, that's what we had

(Laughter) There's one way to interpret this: Liberation, Depression, Recovery, all of which have many syllables.

You can download it later ― it's hard to remember long words.

But seriously, what you see here, you'd have to do a search like this to find it, but President Reagan reinvented political terminology, shifting it towards something friendlier, more popular, more TV-friendly, using verb contractions.

Twenty years before that, the (formal) expression would have been, "Don't ask what you can do." And when it came to President Reagan, "When it happened... Nancy and I."

It was vaguely known, but in fact his work on the syntactic side was overlooked.

to next slide

The question now -- and it's a really interesting question -- is what higher-order shapes are emerging within the web ecosystem -- and especially within the blog ecosystem, because they're really cutting edge.

What happens there will also happen in a larger system.

Clay Sharkey wrote a very interesting article about a month ago that got a lot of attention, and it's basically the distribution of links to different blogs on the web.

It's going to be exponential: a few popular blogs are linked to a lot, and there are many blogs with very few links on one side.

i.e. 20% of blogs get 80% of links

this is very interesting

This caused a great deal of controversy, because the Internet was seen as the ultimate form of modern democracy, where everyone had a voice and everyone was at the center of it.

"Why is this happening?"

It's not like I'm being forced by orders from above.

It's an emergent quality that's emerging from the blogosphere.

The great thing is that people started responding quickly. As soon as Clay published the paper, they started changing the search rules to show different results.

The reason it's basically exponential is that the first to start has an advantage.

If it was the first site, everyone would link to it.

Because a lot of people link to the second site as well.

You can collect a lot of links like this, and then more new participants will keep linking, and it will look like this.

Technorati's Dave Siffrey started doing that, too, just like Sharkey did, after he published his papers, he gave new articles a new kind of prioritization.

We looked at new articles that didn't have a lot of links, but suddenly had a lot of links in the last 24 hours.

In short, focus on new and growing weblogs.

So what he's working with is a tool that can change an entire system.

This is a deliberate "emergence"

We don't have complete control, but we've changed the underlying rules in an interesting way, because we want a more democratic voice as the end result.

And here's the most surprising thing -- and that's the end of the story -- most emergent systems, most self-organizing systems, aren't made up of parts that see the overall pattern, but change their behavior based on whether that pattern is liked or not.

What I think was great about the discussion about the law of power and the software that influences the law is the fact that we're having a conversation.

hope it continues

thank you

What do you think will happen if you put people who have been living on the streets for years in a house? What would happen if you let these alcoholics with mental health problems move directly from the street to their homes?

We had heard that there was an example of this in New York City, in a model called Housing First.

I wondered if this would work in Utah as well.

To make that determination, I decided to test it out, and Kita was one of 17 chronically homeless people I included in this trial.

She lived on the streets for more than 20 years, had mental health problems and was a severe alcoholic.

Kita put her stuff on the bed the first night in her apartment, and she slept on the floor.

For the next three days, I slept by the garbage can near my apartment.

With the help of her case manager, Kita returned to her apartment, but for the next few days she still slept on the floor.

Over the course of two weeks, she learned that it was her apartment and that it would not be taken away, and little by little she built trust and confidence, and finally began to sleep in bed.

Homelessness is an ongoing challenge in many cities across America.

We divide the homeless population into three main categories: temporary homelessness, which is about 75%, intermittent homelessness, about 10%, and chronic homelessness, about 15%.

Chronic homelessness is defined as unaccompanied adults who have been continuously homeless for at least one year or who have been homeless at least five times in the past three years for a total of 365 days.

This mere 15% of the homeless population could consume 50 to 60% of the homeless resources available in a single community.

What's more, it can cost that community $20,000 to $45,000 per year for each chronically homeless person in emergency response costs, like dispatching an EMT, going to the emergency room, as you all know, addiction, getting in trouble with the police, serving time, and so on.

Simply put, it's very expensive for this small population.

Based on this reality, in 2003, the U.S. government invited states, cities and counties to come up with a plan to end chronic homelessness within 10 years.

Utah accepted this invitation and I was asked to lead this effort.

We approved the 10-year plan in 2005, and 10 years later, in 2015, we achieved a reduction in the chronically homeless population, a 91 percent reduction statewide.

(Applause) This is amazing.

When I first embarked on this process, I realized that I had a limited understanding of homelessness and its causes. And I knew that I needed to radically change my beliefs and beliefs, because I was raised with strong individualist theories and a "make it yourself" education.

I had these values ​​because I grew up on a family cattle ranch in a small town in the western Utah desert.

What I learned on the ranch was that, above all else, taking care of the cows came first, that there was always something to fix, and above all, that hard work would fix the world.

I was looking at homeless people through these values.

When I was a teenager, my family used to go to Salt Lake City, and we used to call homeless people "hobos," and when I saw them sitting on the street there, I would think, "What a lazy guy, get yourself a job."

After high school, I left the ranch, went to college, went to work for Ford Motor Company for a few years, got a job with The Church of Jesus Christ of Latter-day Saints, and came back to Salt Lake City.

While working for the church, I had the opportunity to work with the largest homeless shelter in Utah, helping develop and improve the facility's financial and administrative capabilities.

While working there, I learned new ways to deal with homeless people and drug addicts.

It was called harm reduction, and it was about distributing clean needles and condoms.

"I've just thought of another silly thing," I thought.

(Laughter) "So that kind of encourages them to keep doing what they're doing.

Just tell him to stop."

A few years later, I read the early documents of a federally inspired 10-year plan to end chronic homelessness.

As I read through the plans, I thought, "Huh! That's unrealistic.

It's impossible to get rid of the homeless

There are too many individual choices and factors beyond our control.”

But my perspective changed when I attended a conference in 2003 and learned the reasoning behind the 10-year plan.

First of all, this chronically homeless population, which is only 15 percent of the population, is very expensive.

This was a nod to a conservative state like Utah.

The second insight is what I learned about Housing First, or -- Low Barrier Housing.

In New York City, an agency was encouraging homeless people with mental illnesses to move straight from the street to their homes.

They were also still allowed to take drugs and alcohol, just like we can at home.

In addition, although not compulsory, they had a service provision, where a case manager would come to the scene to help them adjust to their new living environment and settle down.

Harm reduction was used here.

At first, I wasn't expecting much from this outreach model, but it's been a phenomenal success rate, with 85 percent of people still living in their homes after 12 months.

A third insight was the importance of building trust.

These people have been abused for most of their lives, so they no longer trust anyone. Clean needles, condoms, low-barrier housing are ways to start building trust.

was essential

On the flight home from the conference, I looked out the window and noticed that my understanding and perception of homelessness was beginning to change.

As I stared out the window, I had very strong emotions and thoughts, and I thought, if there is any state in this country that can end chronic homelessness, it's Utah, because there's an underlying feeling, a desire, a drive for people to work together to help their neighbors, including those who are homeless.

A new vision of how to make this happen began to crystallize in me.

We went to the conference and said, "We could do it in Utah."

And when we got home, a lot of people said, "No, it's not going to work here."

But they said there was an affordable housing agency that would build the first 100 units.

But locals were worried about having 100 chronically homeless people in one place.

To put an end to that fear, we ran a trial run of this plan while we proceeded with the construction of the first 100 units.

We took advantage of existing units scattered around Salt Lake City.

And we debated whether we should choose the homeless who have the least social problems, or should we choose the one who seems to have the most difficulty.

This is where my ranch upbringing helped me.

In the past, my mother used to prepare meals and boil water for her weekly bath on a stove that burned wood or coal.

After many years of chopping wood for countertops, I've learned that when you split a log, start with the thick end first, while you still have the strength.

When we decided to use this "fat end first" method, we chose 17 of the most difficult and difficult to handle chronically homeless people because we knew we would learn the most from them.

Twenty-two months later, all 17 were still living in their homes, including Kita, who still sleeps in her own bed and abstains from alcohol today, 11 years later.

At the end of this trial, one of the young case managers said, "We had a lot of discussions in college classes about which case management theory worked best.

The case management theory we think of now is – do whatever it takes to keep them in their homes.”

We became believers, and over the next 10 years, we built hundreds of units and increased the statewide chronic homeless population reduction rate to 91 percent.

So who are the homeless?

A lot of people keep them away, want them to disappear, don't get in the way of their lives.

Over the course of this 10-11 year process, I've gained a lot of insight into why people become homeless.

I got one of them a few years ago, when I was doing a field trip with a medical community collaboration team.

They were frontline workers, talking to homeless people and prostitutes on the streets, checking their health.

One of the team members said that eight prostitutes there had 31 children who became state wards.

And they say that some of the pimps are their husbands, or even worse, their parents.

These prostitutes, in their late teens, 20s, early 30s, were expected to make the money they needed for the day, but it was to pay $100 a day for heroin addiction, living expenses, and to feed their recruiters.

Unprotected sex pays more, and predictably, this leads to pregnancy.

Children born in these conditions are often homeless.

If you don't feel despair when you see children born under these circumstances, or parents who turn their children into drug addicts at age 7, or babies born to drug-addicted parents, then you're lacking compassion.

I believe that all human beings are of value, no matter who they are.

And it's inconsiderate to blame people whose lives started out like this for where they belong.

(Applause) No one grows up saying, "My dream is to be homeless."

In other words, the good points of harm reduction and housing first are

We are acknowledging that life can be shaped by a complex web of factors.

In these models of support, we go where they are, not where we are, not where we think they should be.

I learned a lot from the trials I did with 17 people.

After many years of living on the streets, people have to learn a lot when they return to living in their homes.

Donald taught me a lesson about such a transition.

When I asked him why the case manager didn't turn on the heater in his cold apartment,

he said "how do you do that?"

he was taught how to use the thermostat

And the case manager saw Donald heating up the canned beans on the counter, just as he's done over the fire for years.

he was taught how to use pots and pans

I also learned that he had a sister whom he hadn't seen in 25 years, who he thought was dead.

Delighted to know he was alive, they soon reconnected.

Hundreds of people like Kita and Donald are now living in homes and reconnecting with their families.

Also, many of our communities are able to save more money on emergency response than they used to.

I've learned over and over again that if you open your heart and listen to someone and put yourself in their shoes, you can't help but wonder if there's something you can do to love them and care for them.

It's for this reason that I continue to devote myself to bringing hope and support to homeless people, who I consider to be my brothers and sisters.

thank you

(applause)

A sky blue canvas with a giant skull sticking out

Bare teeth expressed with an intuitive touch using oil paint and spray

In 2017, this untitled work sold for over $110 million.

But it's not the work of a writer called a master.

This exquisite brushwork belongs to Jean-Michel Basquiat, a 21-year-old black man from Brooklyn.

Born in 1960 to a Haitian father and a Puerto Rican mother, he drew from an early age and grew up naughty in Boerum Hill.

I didn't go to art school, and I learned art through the art I saw in New York museums and the music my father listened to.

Inspired by places no one would have thought of, I would take anime, cartoons, scenes from the Bible, etc. and draw them in my own way on the back of paper in my father's office.

But perhaps the greatest influence on Basquiat was a medical book.

When I was hit by a car when I was a kid, my mother brought me to the hospital a copy of "Grey's Anatomy."

This sparked a lifelong interest in anatomy, and his later work depicted skulls, muscles, and internal organs, representing the power and vulnerability of people on the margins of society.

Basquiat started his artistic career at the age of 17 with his friend Al Diaz.

I spray-painted messages and symbols all over Lower Manhattan and signed the mysterious unit name "SAMO".

He strategically left his works in Soho (the city of art) with humorous yet rebellious and meaningful statements.

After that, he made a name for himself as an artist, and the success of SAMO led him into the art scene as an individual, selling postcards, playing in avant-garde bands in clubs, and daring to seek opportunities to interact with artists he admired.

By the time I was 21, I was immersed in painting.

His creative process was improvisational yet calculated.

Just as the beatnik writers chopped up a piece of text once it had been written and reconstructed it, Basquiat also used the cut-up technique.

When I couldn't afford to buy canvas, I used scraps of wood left on the street to finish my work.

Using oil sticks, crayons, spray paint, and pencils, I also quoted from menus, comic books, and textbooks that were spread out on the floor of my studio.

By keeping this information at hand at all times, we were able to run multiple projects at the same time.

Incorporating disjointed anatomical drawings, reinterpreted historical themes, and skulls from classic still-life paintings, he reinterpreted the reality and history of art as we see it in a unique, visual language.

He borrowed the work of past artists and embedded himself in them to create collages that interacted with the history of art, and the works seemed to interact with each other.

For example, "Toussaint L'Overture versus Savonarola" and "Undiscovered Genius of the Mississippi Delta" are representative works that express Basquiat's interest in history and the present.

Both works have very similar details, such as the head that appears in PPCD.

Combining all of these works embodies Basquiat's restless creative spirit.

These chaotic creations quickly gained acclaim and attention.

Despite his rising public profile, Basquiat insisted on depicting provocative themes, such as identity and oppression.

It featured people on the fringes of society: prisoners, cooks, janitors.

This obsession with bodies, history, and assertiveness can be found in works on the Atlantic slave trade, African history, and contemporary racial issues.

In just under a decade, Basquiat created many paintings, sketches, sculptures, poems, and music.

His creative pace accelerated and his fame skyrocketed, but his artistic career and life were tragically cut short when he died of a drug overdose at the age of 27.

After Basquiat's death, the value of his works continued to rise, but the energy and flair they exuded had far more impact than their monetary value.

He continues to influence music, poetry, fashion, film, and more, and his art continues to shock, inspire, and captivate.

This syringe contains a radioactive glucose called FDG.

Doctors are about to inject FDG into a patient's arm and scan for cancer with a PET scanner.

FDG is immediately transported throughout the body

If there's a tumor, the cancer cells take up a lot of FDG, so it's a landmark for the scanner.

PET tracers, such as FDG, are the most used means of medical diagnosis, and they're made in a particle accelerator hours before a PET scan.

This particle accelerator, called a cyclotron, is often located in a separate equipment room in a hospital.

It uses an electromagnetic field to accelerate charged particles, such as protons, in spirals.

When the proton reaches maximum velocity, it hits a target containing several milliliters of water, which is made up of the heavier oxygen isotope 18O.

When a proton hits one of the heavy oxygen atoms, it releases a subatomic particle called a neutron.

At this point, 18O is replaced by 18F, a radioactive isotope of fluorine, which can be detected with a PET scan.

Fluorine decays by half in less than two hours due to radioactive decay, so it is necessary to perform a PET examination as soon as possible.

So how does 18F detect disease?

Radiochemists in hospitals can use a series of chemical reactions to attach radioactive fluorine to different molecules to create radiotracers.

What kind of tracer to use depends on what the doctor observes.

FDG is commonly used because the rate at which cells take up glucose can signal the presence of cancer cells, the site of an infection, or a decline in brain function due to dementia.

Now the FDG is ready to test the patient.

A radioactive tracer enters the body, travels through the circulatory system, and is taken up by a target, whether it's a protein in the brain or a cancer cell.

Within minutes, large amounts of the tracer have made their way to the target site, and the remaining tracer is cleared from the circulation.

Now doctors can find targets with a PET machine, a positron emission tomography machine.

The radiation emitted by the tracers makes it possible to find them.

The isotopes used in PET decay with positron emission.

Positrons are essentially positively charged electrons.

When the positron is emitted, it collides with the electrons of other molecules around it.

This causes a small nuclear reaction that converts the mass of the two particles into two high-energy photons, similar to X-rays, that are emitted in opposite directions.

These photons hit a pair of detectors placed side by side on the walls of the inspector.

The tester's software uses the data from these instruments to infer where the impact occurred in the body and creates a 3D image of the tracer distribution.

PET scans can detect the spread of cancer earlier than other imaging tests.

It also revolutionized the diagnosis of Alzheimer's disease, allowing doctors to diagnose the accumulation of the disease-signaling protein called amyloid outside of autopsy.

Meanwhile, researchers are working hard to develop new tracers and explore new potential applications for PET scanning.

But is it safe to say that a test that produces radiation in the body and causes a nuclear reaction?

Ionizing radiation itself isn't exactly safe, but in fact, the dose of radiation received inside the body from a PET scan is extremely low.

A single test is equivalent to a few years' worth of exposure from natural sources of radiation like radon gas -- or the amount of cosmic radiation a pilot receives from flying 20 or 30 times across the Atlantic.

Many patients are willing to accept these risks because of the possibility of obtaining a diagnosis and treatment for the disease.

In the 13th century, Genghis Khan embarked on a mission to conquer Eurasia, quickly subjugating nations and bringing them under the rule of the expanding Mongol Empire.

Leading a large army, it was almost impossible to stop him.

But even such a great man had one obstacle, one that even the famous khan couldn't overcome: a wall of ice towering over a mountain pass built by the locals to keep the khan's armies from invading their territory.

No one knows how historically accurate this story is, but surprisingly, it's based on fact. For centuries, people in the Karakorum and Himalayas have been using handcrafted ice to create glaciers that provide drinking water and water for irrigating crops.

But before we get into this fascinating phenomenon, it's important to understand the difference between natural glaciers and man-made glaciers.

There are three conditions required for a natural glacier to form: snowfall, cold temperatures, and time.

First, a large amount of snow falls and accumulates

And the colder temperatures keep the snow piled up through winter, spring, summer and fall.

Over the years, decades, and centuries that follow, the pressure from the snow pack transforms the snow layer into highly compacted glacial ice.

Man-made glaciers, on the other hand, are completely different.

For centuries, some local cultures believed that glaciers live at the junction of the three great mountain ranges of the Himalayas, Karakorum and Hindu Kush.

What's more, some glaciers are said to have a gender, male or female.

Local "glacier growers" can "breed" new glaciers by merging, or "marriage", pieces of ice from male and female glaciers and covering them with charcoal, wheat husks, cloth and willow branches to produce offspring.

Because of this protective cover, the glacier grows with each snowfall each year, turning it into a fully active glacier.

And this creates a sustainable water reserve that farmers can use to irrigate their crops.

These practices have spread to other cultures, where people have created their own glaciers and applied them to solve some of the most serious modern water supply challenges.

Take Ladakh, a desert region in the highlands of northern India, for example.

It's located on the low-rain side of the Himalayas, averaging less than 10 centimeters of rain per year.

Around here, global warming is shrinking glaciers and exacerbating regional water scarcity.

So locals have started building their own glaciers as insurance against volatile water levels.

These glaciers come in two types, horizontal and vertical.

Horizontal glaciers are created by farmers who channel meltwater into canals and aqueducts, carefully channeling it through a series of depressions made of earth and rock.

The villagers meticulously manipulate the discharge of water into this reservoir, each time waiting for a new layer to freeze before filling the depression with the next water.

In early spring, these stored ice begins to melt, providing villagers with water for irrigating their fields.

When locals create vertical glaciers, they use meltwater from existing glaciers higher than the village.

Meltwater enters channels that run along the slopes, flows until it reaches the farmland, and then jets into the air through aqueducts.

As winter temperatures drop, the water spewing out of the aqueduct freezes in arcs that eventually form a 50-meter ice sculpture called a stupa, which looks like an upside-down ice cream cone.

This inverted shape minimizes surface area exposed to sunlight in spring and summer

Small glaciers are slowly melting, ensuring a steady supply of water for farmers to feed their crops.

These methods may be old, but they're becoming more important because global warming is having a negative impact on our planet.

In fact, many regions outside of Ladakh now have their own glaciers.

Using modern glaciation technology, the Swiss built the first stupa in the Swiss Alps in 2016.

Villages in Pakistan, Kazakhstan and Kyrgyzstan have over 100 projects

Someday, perhaps, we'll be able to build ice walls out of locally grown glaciers, but not as walls to keep people out, but to allow us to live in some of the most hostile environments on earth.

I am here today not as a professional

I came here as an individual who is very interested in how one can master things.

I think it's not just about how good you are now, it's about how good you're going to be in the future.

I was visiting a maternity hospital in northern India

As I watched the medical staff attending the birth, I realized that I was witnessing the ultimate example of how people can or may not improve in the face of complexity.

In this region, there is a 1 in 20 chance of a baby dying at birth, and the maternal mortality rate is 10 times higher than in other regions.

We've known for decades what the critical medical interventions of childbirth are, which can mean the difference between life and death, but the trouble is that even the simplest of tasks can be difficult, especially here.

For example, you wash your hands, you put on clean surgical gloves, but here, the wash basin is in another room, and you don't even have clean surgical gloves.

In order to reuse surgical gloves, they wash them with diluted bleach, and some of them still have blood on them.

10% of babies are born unable to breathe

i know what to do

Wipe the baby with a dry cloth to induce breathing.

If you don't start breathing, apply airway suction.

If that doesn't work, let him breathe with a respirator mask.

These are mostly things I learned from textbooks, but look, the respirator mask is broken.

This shocking image brings home the seriousness of the situation.

This is a 10 minute old baby alive barely alive

No clean dry towels, not yet wiped dry, not directly warmed by the skin, not sterilized clamps holding the umbilical cord.

I'm just telling you to get an infection.

A successful birth requires a successful team to help.

Everyone on the team has to be highly skilled and well-coordinated. The midwives in a place like this, the doctors who support them, the stockists who keep 22 essential medicines and supplies stocked next to the delivery table, and the medical director responsible for the overall quality of the facility.

They are experienced professionals

All I met were staff who had been present at thousands of births.

Faced with a complicated situation, they have their hands full.

Technology has stopped improving

It's about how well you know the technology that really matters.

Committed to addressing underlying issues

How do professionals improve their skills?

How do you become a master?

There are two ways of looking at this

One is due to the traditional view of education.

Go to school, study, practice, and graduate when you're done.

Professionals are those who can improve their skills on their own.

This is the method that professionals of all professions have mastered

This is how doctors learn, lawyers and scientists.

musicians too

this is effective

What about Juilliard's legendary violin teacher Dorothy DeLay?

She educated violin geniuses Midori Goto, Sarah Chan Itzhak Perlman

We all followed her as a talented student when we were young and trained under her guidance for years.

According to her, the most important thing was to inculcate the habit of thinking and learning so that when she leaves the family, she can do well in the world without her help.

But in the world of sports, it's the opposite.

They say, "There's no end to a player's development, everyone needs a coach."

without exception

Even the best need a coach

So I tried to think of this as a surgeon.

I was going to pay to hire a coach to guide me in the operating room.

i thought it was silly

Because being an expert means you don't need a coach.

Which idea is correct?

I found that coaching was introduced into sports as a very American concept.

1875 Harvard and Yale battle in the first American rules football

Yale hired a head coach, Harvard didn't.

what was the result?

In the next 30 years, Harvard won only four times.

I decided to hire a coach

(Laughter) That's how the sport has become.

but it is

Does it apply to other fields as well?

I decided to ask none other than Itzhak Perlman.

He practiced Dorothy DeLay's method and grew up to be one of the greatest violinists of his generation.

One of the perks of being a New Yorker contributor is that if you contact anyone, you get a call back.

(Laughter) Perlman called me back.

And then we talked for almost two hours straight about how he got to be who he is today.

I asked, "Why don't violinists have coaches?"

"I don't know, but I had it."

"Eh, did you always have a coach?"

"My wife Toby, of course."

They both graduated from Juilliard, and she gave up being a concert player to become his coach, sitting in the audience watching him play and commenting.

"Itzhak, you played a little mechanical in the middle of the song.

How do you think we can improve? ”

He said it was important in every aspect of his development.

There were a lot of problems with going it alone.

First, I don't notice the problem that is blocking me, and even if I do, I don't know how to solve it.

As a result, at some point your growth will plateau.

Thinking about it, I realized that's exactly what happened to me as a surgeon.

I started clinical practice in 2003, and my learning curve climbed steadily for the first few years.

Every year the complication rate goes down

After about five years, the descent stopped.

Then again, a few years later, I realized that I was no longer seeing any improvement.

I used to think, "Is this my limit?"

So after some more thought, I decided

"Okay, let's put a coach on."

So I asked my mentor, a retired professor named Bob Osteen, and he agreed to mentor me in the operating room.

I remember the first case very well.

went very well

I thought it would hardly be pointed out when the surgery was over.

But his notebook was filled with scribbles.

(Laughter) "It's just a little thing."

(Laughter) That's the point.

"Did you notice that the lighting is off the surgical field?

I was treated with reflected light for about 30 minutes.”

"Besides-" "I've noticed that your elbows are sometimes floating.

You're not in complete control of your body.

The surgeon's elbows should naturally droop to the sides

In other words, if your elbow seems to be floating, you should choose another piece of equipment or change the position of your foot.”

This was a completely different dimension

I felt that there was something essential about this experience.

He was describing my behavior, as great coaches do. The coach would be the eyes and ears to observe from the outside, and paint a more accurate picture of reality.

find the basic elements

They analyze my every move and help me reconstruct it.

After two months of coaching, I found myself starting to improve again.

A year later, I noticed my complication rate was even lower.

was not pleasant

I didn't like being watched, and there were times when I didn't want to keep trying.

Before I improved, there was a time when I felt my arms had fallen even more.

But I realized that the coach was getting to the heart of something very important.

I also ran the Ariadne Lab, a center for innovation in health systems that tackled challenges in healthcare delivery, but also the world's fertility problem.

As part of that, we worked with the World Health Organization (WHO) to develop a safe childbirth checklist.

list the basics

It's broken down into chunks, and it's a critical step that the team must do every time: when a pregnant woman is brought into labor, when they're ready to apply pressure, when the baby is delivered, when both mother and baby can go home.

And we knew that just handing out checklists wouldn't change much, and that teaching in the classroom wasn't enough to get people to make the changes they needed.

So I reflected on my experience and said, "Let's try coaching.

Would you like to do some large-scale coaching? ”

Find great partners, including the Indian government, in India's largest state, Uttar Pradesh.

Comparisons were made in 120 maternity hospitals

Half of the maternity centers were just observing, and the other half had coaches.

We train these teams of doctors and nurses and managers to learn observational techniques to develop their strengths and improve their weaknesses.

One of the most important skills I've found in training staff is communication.

If the baby's artificial respiration mask is torn, surgical gloves are out of stock, or if someone forgets to wash their hands, educate the nurses to point it out properly.

And educate everyone, including the manager, on how to listen properly.

A small team of coaches coached 400 nurses and other midwives and 100 obstetricians and managers.

We tracked 160,000 birth outcomes

Result is…

The control group, who received no coaching, performed only one-third of the 18 basic steps we measured.

Most importantly, we didn't see any improvement over the years of this study.

In the group that received four months of coaching, followed by eight months of gradual independence, we observed that more than two-thirds of the procedures had improved to the point where they performed properly.

It means that there was an effect

It was clear that the quality had improved, and we were seeing improvements across maternity hospitals, demonstrating the potential for coaching to add value to our work.

You can imagine a lot of jobs where coaching is successful, and people who are successful with it.

We were just getting started and we still had a lot of work to do.

To significantly reduce mortality, we had to integrate all the checklists.

But some institutions are starting to make strides, and this maternity hospital was one of them, because the coaching helped them master the basic procedures.

You can see that from this example

This 23-year-old woman came to the emergency room to give birth to her third child.

Her membranes broke in the treatment selection (triage) area and she was taken directly to the delivery and delivery room, so check items were checked.

I've time-stamped the photos, so you can see how quickly things can unfold and how complicated this can be.

In four minutes, we took the blood pressure, the pulse, and the baby's heartbeat.

What this meant was that blood pressure cuffs and fetal ultrasound heart monitors were available, and the nurses knew how to use them.

The team was highly skilled and well-coordinated.

The mother was in good health and the baby's heart rate was normal at 143.

Eight minutes later, the labor pains increased in intensity, and the nurse washed her hands, donned clean surgical gloves, and made sure the woman's cervix was fully dilated.

It doesn't matter when the baby is born

The nurse immediately moves on to the next check item.

After inspecting all the equipment, I made sure my bedside had everything I needed.

We had respirators, we had sterile towels, we had sterile equipment.

Three minutes later, the mother gave her one push and the baby was born.

(Applause) As I watched this birth, I immediately noticed a change in the atmosphere of the room.

The nurse was looking at a community health worker who had come to accompany a woman in labor because her baby was sick.

The baby was pale and drooping and not breathing.

the baby was about to die

But the nurse kept following the checklist.

Wipe your baby with a clean towel

A minute later, when I realized it wasn't irritating the baby, I ran to get a respirator, and another nurse went to get an inhaler.

I didn't have a mechanical suction machine because the electricity supply was unreliable.

A minute later, when the thick green liquid came out, I continued sucking and the baby started to breathe.

(Applause) In another minute, the baby started crying.

Five minutes later, the child's skin was fine, warmed by the mother's chest, and the mother took the nurse's hand, and they all breathed a sigh of relief.

I've seen teams reborn thanks to coaching.

And I've seen at least one person's life saved.

When I checked the mother a few months later,

Both mother and child were very healthy

baby name ansika

means "beautiful"

This kid is a symbol of what's possible when we really understand how to improve.

thank you

(applause)

(Cindy Steivers) The future of storytelling.

Before we talk about the future, let's think about what never changes in storytelling.

(Shonda Rhimes) It's something that doesn't change.

It's obvious, but good stories don't change -- the desire for people to come together and tell stories -- the desire to tell stories that seem universal, the impetus that drives us to embrace, tell, and share stories -- the desire to tell stories around a campfire that makes us feel like we're not alone.

these things won't change

I don't think the essence of storytelling will change.

Cindy: Well, prior to this conversation, I spoke with Susan Lyne, the former head of ABC Entertainment, back when you worked on Grey's Anatomy -- (Shonda) Yeah.

(Cindy) She said she has fond memories, and she told me the story of when she decided to cast her. She told me that you gathered the actors and had them read the script without consulting anyone in the upper management.

Not only have you retrained the upper management of the studio, but she says you also feel that -- and I agree with you -- you've also retrained the expectations of the American television audience.

What do viewers need that they haven't realized yet?

(Shonda) Something you haven't noticed yet?

I think it's still at that stage

TV is still so far removed from what the real world actually looks like.

I didn't want to make a statement with people who looked very different, and I didn't want to do anything special.

I had no idea it was novel or unusual or weird.

I got them together because they were funny actors, and I didn't know for a while that it was a complete surprise to other people.

I just want this actor to play this role

how they look

i just thought i'd give it a try

So what's interesting is that when you look at the world from another perspective, that is, people who normally don't make decisions can do different things.

Cindy: Now you're running this big organization. You could call it a giant. Like you said last year, she's a giant.

What do you think lies ahead?

You have a huge budget for the production of the show.

While the methods of storytelling have been greatly democratized, distribution is on a large scale, and there are people renting the networks, providing audiences to advertisers and paying for it.

Now that anyone can be a storyteller What do you think about the change in business models?

(Shonda) It's changing day by day.

The very rapid change is something to behold.

What I feel is that I can understand panic like I'm picking it up.It's not a bad thing.

it's exciting

It's great that something like homogenization is happening -- that everyone can create something.

It's kind of scary how hard it is to find good work.

too many works

Today, there are 417 shows on TV that you can watch everywhere all the time, but you can't find them.

Good work is hard to find

Anyone can create something, so there's a lot of bad stuff out there.

It's like everyone calls themselves a painter

there are not many good painters

It's getting harder and harder to find good stories and good shows.

If there's one short show on a channel, but there are other shows scattered around, it's much harder to find a hit.

Finding gems and finding the makers of great web dramas -- I feel sorry for the critics, because they have to stay home all day and watch it all.

it's not an easy job

The distribution side is getting bigger and bigger, but it's getting harder and harder to get good programming for everyone.

When it comes to the news, you can narrow your options based on who you are, but TV, and by TV, I mean TV shows in general, seems to be getting wider and wider.

Anyone can make a story, and sometimes talent is buried.

It's getting harder to find. At some point, it's going to collapse.

Some call it the golden age of television.

i don't think so

At some point it will collapse a bit and then rebuild again.

I don't know if that medium will be television.

I don't know if that model is sustainable.

(Cindy) Any other models? Amazon and Netflix are pouring huge amounts of money into it.

(Shonda) That's right

that's an interesting model

There is also an exciting part

There's something exciting for content creators.

There are also exciting things for people around the world.

It's exciting that so many shows are now being broadcast in multiple languages, featuring fascinating characters from all over the world, and that everyone can watch them at the same time.

It makes a lot of sense that television can express an international sensibility, and programming can do that.

Television shows, for example, are made with an American audience in mind.

We're going to make a show, then send it out into the world, and hopefully it'll work, without really thinking that America isn't everything.

I love America, but that's not all

The thing to think about is that there are other places in the world that we should be interested in telling the story.

Then the world will feel smaller

Somehow-

It pushes the idea that the world is a universal place, and it makes the story universal.

They cease to be “others”.

Cindy: As far as I know, you're also a pioneer in creating new shows in groundbreaking ways.

In 2012, when you produced "Scandal: Entrusted Secret," it got an unprecedented amount of "likes" on Twitter and gained tremendous support.

Do you have any secrets for making your next show?

What happens in that regard?

(Shonda) I have an interesting idea.

It's called "Still Star-Crossed," and it's scheduled to air this summer.

I have an interesting idea

I don't know if I'll make it in time for the broadcast

I thought it was a pleasant way to

I thought it would be interesting to do a live tweet on Twitter during the program.

What I didn't expect was that even the critics started live-tweeting with me.

Fans -- when you're all around them, they're like a campfire. There's a lot of people on Twitter, and when you chat with each other, you share your experiences.

CA: So many different people create stories, but only a handful of them are hits and have audiences. How do storytellers stand up?

(Shonda) I'm struggling with that concept as well.

Should I make it a subscription?

Will viewers decide whose program they will watch or not?

(Cindy) Need a passport for Shonda World?

(Shonda) What do you think? You need to think about it.

I think there are many ways, but I can't say which one is better.

So, let's be honest, a lot of content creators don't want to be distributors, because what they want to do is create content.

i love making content

So I want to make a living, and I want to make a decent income for my work, and it's hard to make that happen.

And at the same time, I want to make sure that everyone I work with, everyone I work for, has some kind of income and can make a living.

It's only going to get harder to figure out how to distribute it.

Cindy: How about a lot of new tools like VR (virtual reality) and AR (augmented reality)?

What I find interesting is that you can't binge-watch, you can't fast-forward.

What will that look like in storytelling in the future?

SHONDA: Over the past year, I've spent a lot of time looking at them, trying demos, looking at them.

It's intriguing, mainly because -- they tend to think of it as technology for games, and I think it's really good at representing action.

Instead of looking at a TV screen, you can sit next to a character and listen to him talk.

Even through the TV screen, I unintentionally fall in love with you

What if you were next to me, maybe a character like Huck trying to assassinate someone.

Instead of watching him talk very quickly to other characters, he walks into the closet and looks at you and tells you what's going to happen and what he's nervous about.

It's more theatrical, and I don't know if it'll work, but I'm excited about the concept and how it's going to be received by audiences.

I think it would be interesting to try out some of these ideas, because the audience that watches my show is women between the ages of 12 and 75, so it would be interesting for them.

(Cindy) What about viewer input?

Are you interested in seeing the story for a certain amount of time and then letting the viewer decide which story to choose?

Shall we run away with Fitz?

It's hard, not because I want to control everything, but because I know from experience that if you can decide what happens to other characters while you're watching TV or a movie, the story doesn't get much more interesting.

I could say what I wanted to happen to Walter White, but the story would be different and it wouldn't be as powerful.

If I were to write the ending of "The Sopranos," it would be fun, it would be satisfying, but it would change the story and not have the same emotional impact.

Cindy: I ​​can only imagine what would have happened if you had written it.

I'm sorry, let me take a breather

SHONDA: What's great is that I can't even imagine how Vince ended up in his own way.

If you can decide for yourself, if the shark wins in "Jaws," the story loses its power.

A story is all about what it tells you, and after you've finished watching it, you might get angry, you might argue, you might fight, and that's why it works.

That's why it's art

Otherwise, it's just a game. Games can be art, but in a different way.

CA: Having a gamer sit in front of a screen and make a point of commenting on what's going on feels more like sharing an experience than storytelling.

(Shonda) That's also a campfire.

I'm not saying it's not storytelling, but it's a collective thing.

(Cindy) So, very, very -- how about everything getting shorter and shorter?

Snapchat now has a "show," but it's only one minute long.

(Shonda) Interesting

I also think that it looks like a commercial somewhere

Is that so?

But there are also people who think, "I see."

i think there is something wonderful

It would be great if most of us watch TV on our cell phones. Considering a place like India, information comes in and products come in through cell phones.

Some distributors could make money if they were forced to pay more for shorter content.

If you are the creator of the content, the cost of production will be lower.

By the way, if you're 14 and you're like my daughter, and you have short attention spans, you'll want to watch something short, you'll want to make something like that.

If you can do it well and make it feel like a story, people will see it in any format.

Cindy: I ​​love that you have daughters. I want to ask how young people consume entertainment, not just entertainment, but news.

If they can only see what they've seen due to over-the-top algorithms,

How can we fix that and foster an impartial citizenship?

SHONDA: My thoughts and my correction methods may be very different from others.

(Cindy) I don't care if it's speculation.

(Shonda) I honestly don't know what to do in the future.

My poor children are my guinea pigs.

I'm doing an "Amish Summer Vacation." I turn off all my electronics and put away all my computers and stuff.

It's a pretty harsh world, to be honest, as adults, we're so focused on seeing what we want to see that sometimes we don't even realize that we're being given what we consider to be our opinions.

The way it works now is that when you watch the feed, it's modified so that you only see your opinion, and you feel more strongly that you're right.

So how should we distinguish?

It's even a little scary

Either we overdo it, or we mess everything up, or we just -- I don't want to look negative, but we just get stupid.

(Cindy laughs) (Cindy) Well, can you imagine how scripted fiction could be remedied?

SHONDA: I think a lot about how television can have a huge impact on educating people. When you watch television -- for example, there's been research done on medical dramas.

I believe 87 percent of people get most of their medical and medical information from medical dramas, not from doctors, not from papers, but from dramas.

So I try to be accurate, and every time I get it wrong, I feel like I've done something wrong, but I also pass on useful medical information.

There are many other ways to convey information in such programs.

There are a lot of ways to get fair and unbiased information on such a show while the audience is having fun -- even if they don't want to tell the news -- not in a creepy way, like brainwashing people, but in a way that's very interesting and intelligent in a way that doesn't impose one-sided information like this is the truth.

But it might seem strange to tell the news in a TV drama.

Cindy: It's strange, but a lot of what you describe as fiction also refers to the present day, doesn't it?

(Shonda) That's why "Scandal" is a little scary.

We're going to make a drama about politics going crazy, and the way we're going to make a drama, basically, we all read the newspapers.

I read every article and talked about it

I have many friends in Washington.

I made the drama as a kind of speculation.

Put your heads together and think, What if the wheels came off the bus and everything went wrong? What

It was an amazing experience, and now I realize that at the time, the wheel was actually coming off and things were going crazy, so I feel like what was just a guess became a reality.

The ending of this year's season was supposed to be Russia controlling the American elections. We wrote the script, we had it filmed, we were all set, but all of a sudden there was suspicion that Russia was actually involved in the American election, and we had to change the ending of the season.

I went to work and said, "It's the scene where the mysterious woman starts speaking Russian.

I have to fix that and think about how to change it."

The idea was born out of our predictions, a scenario that we thought was impossible.

(Cindy) Is that so?

Where are you watching in the US and beyond?

Anyone doing interesting storytelling?

(Shonda) Well, there are a lot of interesting things.

Of course, British television has always been great, and they've always produced something interesting.

I'm busy with work, so I don't watch much TV.

And I try not to watch a lot of TV until the season is over, even if it's American TV, because otherwise it's going to affect me in a weird way.

I wonder what it would be like if a character wore a crown or sat on a throne.

I'm going crazy

I try not to watch as much as possible until the season is over.

But there's a lot of interesting stuff on European television.

At the International Emmy Awards, I looked around and saw a lot of things, and I was thrilled.

There was something that made me want to see

Cindy: Can you think of it, if you don't like to overthink the technical stuff, a few years ago on this TED stage, someone who was talking about the visual experience put on Google glasses and said that he could see your show with his own eyes.

Have you ever thought about it? Sitting on the floor of your family's pantry -- Did you ever think about trying other mediums when you were a kid?

how about now?

(Shonda) Other mediums?

For storytelling? Media other than books?

I wanted to be like Toni Morrison.

I didn't even have a TV in my head

The idea that there could be bigger worlds, the idea that things could be made more magically -- I'm always excited when new technology comes out, and it's one of the first things I want to try.

The exciting possibilities are endless now and it's exciting

If you ask me, it's like living in the wild, because no one knows where it's going to end.

You can tell stories anywhere, which is cool. Once you figure out how technology and storytelling creativity can mesh, the possibilities are endless.

Cindy: Technology has also made possible the things you mentioned earlier, the recent phenomenon of binge watching, since you started making dramas, right?

Does that change the storytelling process?

The story is ready before the season starts, right?

(Shonda) No, I just know how it ends.

So for me, I have no choice but to say that some of my shows have been going on for 14 seasons, and some people have been watching them for 14 seasons, and some 12-year-old girls you see at the grocery store have watched 297 episodes in three weeks.

It's true. It's a very different experience. It's about being inside a story in a very short period of time, in a very intense and intense way.

(Cindy) It's like visiting a country and then leaving -- (Shonda) It's like reading a great novel in one go.

The experience will also be beautiful

You don't have to keep watching something for 14 seasons

it doesn't have to be

(Cindy) Do you think there are any topics that should not be touched upon?

(Shonda) I don't think of the story that way.

I think about the story around the characters and what they do, and I think about what they need to do to move forward. I don't think the story is just the plot.

really say so

"Tell me properly, I want to know the real content"

I don't think like that

I don't do things that make me think I have to write these things.

Cindy: Well, how much are you going to spend -- you recently sat on the Board of Planned Parenthood and got involved in Hillary Clinton's campaign.

How much are you willing to use storytelling in the real world to make a difference?

SHONDA: Well, this is a tough question, because a lot of people find it difficult not to have a story.

I would say that there are many places where there is a lack of positive narratives that can help organizations.

There are many campaigns that would do better with a better story.

The Democrats can go farther if they tell powerful stories.

There's a lot you can do with storytelling -- not just fictional narratives, but even the narratives of the authors of the speeches.

I can see it, but I don't know if it's my job.

(Cindy) Is that so?

A round of applause for Shonda (Shonda) Thank you

(applause)

I've been doing research on the life of the now-deceased president.

I wake up with Lincoln and go to sleep thinking of Roosevelt.

But when I think about what I've learned about the meaning of life, it reminds me of a graduate course at Harvard by psychologist Erik Erikson.

Ericsson said that a fulfilling life requires an inner balance in three realms: work, love and play.

Whereas pursuing only one area creates a sense of loss in old age,

When you immerse yourself in these three realms, you can live life to the fullest not only with a sense of accomplishment, but with peace of mind.

To tell the story, I look back at the lives of two presidents I studied: Abraham Lincoln and Lyndon Johnson.

As for the first job, I think Lincoln's life tells us that it's good to have great ambitions.

he had big ambitions

But it wasn't for mission or power or prestige or reputation, I wanted to achieve something worthwhile in my life to make the world a little better.

Even as a child, Lincoln had valiant dreams.

he had to leave the farmhouse where he was born

No formal education, except for short-term classes.

Whenever he had free time, he read

When he got his hands on the Bible and Aesop's fables, he was so excited that he could neither sleep nor eat.

it is said

As the poet Emily Dickinson said, "No ship can take you far like a book."

Lincoln is obsessed with books

Without traveling to Europe, I went to sunny England with Shakespeare's kings, and I went to Spain and Portugal with Byron's poetry.

Literature improved his environment.

But when I was young, I faced a lot of death, and I suffered from death.

His mother passed away when he was 9 years old, and a few years later his older sister died while giving birth, and his first love passed away at the age of 22.

In addition, his mother will meet again in the afterlife upon her death—without touching her wish.

I just said, "It's time to say goodbye, I'm not coming back"

As a result, I was obsessed with the idea that when I died, my life would shatter into pieces.

But as he grew older, he found some solace in the notion of ancient Greece and other cultures, the idea that if you achieve something worthwhile in life, it will live on in the memory of others.

You leave your mark on posterity with honor and reputation.

that noble ambition became his goal

I was able to overcome the depression I had in my early 30s because I had a purpose.

There were three events that overwhelmed him

I knew breaking off my engagement to Mary Todd would be a blow to her, because she wasn't ready to get married.

My best friend, Speed, left Illinois for Kentucky after the death of his father.

Lincoln's political career in the state legislature was declining.

A friend who worried that he was depressed and tried to commit suicide

removed the knife from his room

My best friend regained his speed and said, ``If you don't cheer yourself up, you're going to die.''

Lincoln said, "I could die right now, but I haven't done anything yet to make you remember me."

Inspired by his ambitions, he returned to parliament.

won the seat of parliament

And ran for Senate twice, lost twice.

Hemingway said, ``Everyone can falter, but some people are strong when they are weak.''

He then surprised the world by defeating three more experienced, educated, and well-known rivals in the presidential race.

When he was elected in the general election, he took his rival into the cabinet and surprised the world even more.

This unprecedented act made everyone think, "He's like a frontman compared to those three."

When asked, "Why are you doing this?"

Lincoln replied, "The strongest and best men in our country.

This country is in danger, we need their strength."

Lyndon Johnson wouldn't have said that, "I'd rather have my enemies outside piss into my tent than let me out of my tent."

(Laughter) But it soon turns out that Lincoln is the clear commando in this troublesome lineup.

Rivals find Lincoln with unrivaled emotional power and political wisdom far more important than his seeming lack of history.

First, he had an uncanny ability to empathize and care about the perspectives of others.

When tangles arose, we repaired discord.

He was happy to share his achievements, took responsibility for his team's mistakes, always admitted his mistakes, and learned from them.

Here are the qualities to look for in a 2008 candidate

(Applause) Don't get angry over little things.

Never swayed by jealousy or contempt

And he expressed his steadfast convictions in his daily discourses and speeches.

The beauty of the language he used was like Shakespeare and poetry, which he loved so much, had entered his mind.

When the Emancipation Proclamation was signed in 1863, I brought my old friend Speed ​​back to the White House, and I remembered a conversation from decades ago when he was miserable.

And he pointed to the proclamation and said, "This decree will fulfill my greatest wish."

But when he was about to sign the declaration, his hands were shaking because he was shaking hands with so many people.

he put down his pen and said

“This is what it means to put your soul into

But if you sign with a trembling hand, you'll be told you hesitated." He waited until he had a pen and signed with a strong, clear hand.

But Lincoln had no idea how his reputation would grow.

I was thrilled to find an article in a New York newspaper about the writer Tolstoy in the early 1900s.

In that article, Tolstoy said he had never been outside, to a remote corner of Russia where only barbarians lived.

Knowing Tolstoy, they asked me to tell them the story of one of the greatest figures in history.

Tolstoy said, "When I told them about Napoleon, Frederick the Great, and Caesar, they were delighted.

Before I had finished speaking, the barbarian boss stood up and said, 'Wait, I haven't heard of the Greatest Ruler.

A man who speaks in the voice of thunder and laughs like the sunrise If a young man travels he will be old when he arrives I want to hear a man from a place so far away called America

Can you tell me the story of Lincoln?'” Tolstoy was surprised.

i told you everything i know

During the interview, Tolstoy

They say that Lincoln was not as eminent as Napoleon or Frederick the Great.

But his greatness, historians alike say, was in his sincerity and his gritty nature.

So the powerful will that drove me through my bleak childhood finally came out.

An ambition that I painstakingly taught myself and endured through a string of political failures and dark days during the war.

It's his story that's been passed down

Including family, friends and co-workers, the second, love, also requires work and commitment.

I worked on Johnson's memoir, and the last time I saw him, he had spent years pursuing work, power, and fame, and when he retired as president, he had no soul or drive left to get through his days.

I had a unique encounter with him.

At 24, I was elected a White House Fellow.

party at the white house

i danced with him

No wonder there were only three women

He whispered in my ear that I wanted him to work for me at the Prime Minister's Office.

awkwardly

For months before that, I had been active in the anti-Vietnam War movement like many other young people, and my article criticizing Johnson unfortunately appeared in the papers two days after the party.

(Laughter) It was an article about how to remove Johnson from government.

(Laughter) I thought he hated me.

Amazingly, he said, "Bring her here for a year. I'm the only one who can convince her."

So I decided to serve at the Prime Minister's Office

I followed his ranch to write a memoir, not understanding why I was hired.

I'd like to believe it's because I was a good listener

in his story

had the power to draw people

But I later found out that half the story had tail fins.

nevertheless

It was wonderful, so I think he was attracted to me because I was fascinated by his story.

I was worried that my youth was also the reason

There were rumors that he was a womanizer

I used to talk to him about lovers all the time, even when I didn't have one.

Everything was perfect until the day he wanted to talk about our relationship.

I had a strange feeling when I was taken to a lake that was conveniently named Lake Lyndon B. Johnson.

While wine and cheese are lined up romantically

He said, "Doris, more than any woman I know..." My heart sank.

That's when "You remember off-black"

(Laughter) It's embarrassing to think about what I was imagining.

As I get older, I realize how privileged it was to spend hours with the late celebrities.

The winner of many battles, the man who established the triad of civil rights, health care for the elderly, and educational aid.

However, the approval rating plummeted during the Vietnam War.

He was so sad and weak that he began to share fears, sorrows and worries that he never showed when he was at the height of his power.

My time with Johnson inspired me to understand what I later wrote in a book, the inner workings of a man of social standing.

But I also resonated with what Erikson tried to teach us about the importance of finding balance in life.

Apparently, Johnson had what it took to be happy until he died, in the sense that he was president.

I had servants who would meet my every whim, and a family who loved me dearly.

Yet, after years of devoting myself solely to work and personal success, when I retired, I found no solace in my family, in my pastimes, in my sports, or in my hobbies.

Without a job, even family love seemed unable to fill the gaping hole in my heart.

Along with his spirit, his body has withered away, and it feels as if he has brought his own death.

In the years before he died, he said that Americans hoped for a new president and that he would be sad to be forgotten.

He said in a very sad voice that he should have spent more time with his children and grandchildren.

but it was too late

Despite all his power and wealth, he died a lonely death, the one he feared most.

A third kind of play that he never learned to play, I learned over the years that it takes time and energy. I've learned over the years that sports, music, art, literature, or any hobby can bring joy, comfort, and fulfillment.

Lincoln, who loved Shakespeare, went to the theater hundreds of times, even in the darkest days of the war.

When the lights went out and Shakespeare's play began, they said that those precious few hours would take them back in time to Prince Hal's time.

But Lincoln's more important rest, which Johnson didn't enjoy, was his love of humor and the exploration of life's glamor as a photometer to sadness.

He said he laughed so as not to cry He preferred a good story to a drop of whiskey

His speaking ability was first noticed when he toured Illinois.

Lawyers and judges cycled through the courthouse, and many people came to hear Lincoln speak.

With his back to the fire, he kept the audience engaged for hours with his varied tales.

He remembered stories and could recall them whenever he needed them.

Numerous anecdotes that cannot be imagined from the seated statue—

For example, his favorite was the story of Revolutionary War hero Ethan Allen.

I'll tell you in his narrative, when Allen went to England.

The British were still offended by losing the Revolutionary War, and to embarrass him, they put up a giant picture of General Washington inside the latrine.

I thought you'd be angry at me for insulting me like that.

he wasn't angry at all

They asked, "Did you see Washington in the toilet?"

"Looks like it's the perfect place for him," Allen said.

“What do you mean?”

"British people can't fucking slow down when the general sees them."

(Laughter) (Applause) In the middle of a tense cabinet meeting, when you hear this kind of talk, it takes a lot of weight off your shoulders.

Lincoln found a way to get through the day, going to the theater night after night, displaying an extraordinary sense of humor, and quoting Shakespeare and poetry.

For me, I'm grateful that I became a huge baseball fan and found a hobby.

From the start of spring training to the end of fall, I was able to find a passion outside of work.

It started when I was six years old, and my father taught me how to keep score while listening to baseball so I could keep track of Dodgers games during the day while he was at work.

For a six-year-old, his father came home every night to listen, telling him how the day's game was going, inning-by-inning, in excruciating detail.

But my dad made me feel like I was telling a great story.

It makes me think there's magic in the story to keep my father's attention.

I'm sure I've learned the art of talking night after night with my father.

Because at first I was so excited that I thought, "The Dodgers won!"

Because I inadvertently tell the main point of the two-hour talk.

(Laughter) Eventually, I learned to follow the story.

I was a big Dodgers fan at the time, so in my first confession, I confessed to two baseball-related sins.

First, Dodgers catcher Roy Campanella came to my hometown while I was preparing my communion.

I was so excited to be able to see the players in places other than the ballpark.

But he was supposed to speak at a Protestant church

If you're a Catholic, you'll be killed as soon as you cross the threshold to enter a Protestant church.

When I complain with teary eyes

My father said, “Tell me about sportsmanship.

It's not a sin because I'm just listening."

Told

But that night, for some reason, I felt like I lost my eternal soul in exchange for an evening with Campanella.

(Laughter) Because there weren't any indulgences I could buy.

In my first repentance, this sin

I confessed to the priest

“Okay it has nothing to do with religion”

But unfortunately I was asked, "What else?"

I said my second sin

I interrupted other things to say that I was cursing.

The priest said, "Who did you curse like that?"

(Laughter) I was hoping the Dodgers would win their first World Series.

Asked about curse frequency

I said I pray every night

(Laughs) "I'm a Dodgers

I love you but one day they'll win fair and square

I don't need that kind of request."

i said yes

I'm glad the baseball-loving priest made my first confession

(Laughter) When my father died suddenly of a heart attack when I was in my 20s, before I was married and had three sons, I passed on his memories and my passion for baseball.

When the Dodgers moved to Los Angeles, I lost interest in baseball, but when I moved to Boston, I became a huge Red Sox fan.

Even now, when I buy a season ticket and sit down with my son, sometimes when I close my eyes toward the sun, I'm back to being a little girl, feeling my father's presence and seeing the players on the grass at the time: Jackie Robinson Roy Campanella Pee Wee Reese Duke Snyder.

It's time to feel the magic

When I open my eyes and see my sons where their father used to be, I feel that they are connected by loyalty and love to a father they have never met.

That's why I'm always grateful for my curiosity about history, which made me spend a lifetime looking back.

Let me learn the meaning of life's hardships from such a great man.

If you let your deceased loved ones and respected celebrities of history be made to believe and promised to retell their lives, as Lincoln wanted them to be, they will indeed live on.

I am honored to be able to speak to you today.

(Applause) Thank you.

A few years ago, about seven years ago, I found myself hiding in a makeshift toilet at a festival -- a toilet for a music festival.

It was so bad that I couldn't even sit down, so I just stood there, the toilet paper was out, it was all muddy, and it smelled terrible.

I was standing there thinking, "What are you doing? I'm not even dying."

The reason I went to the festival was because at the time, I was volunteering for a large charity that was working on climate justice. Seven years ago, people didn't believe in climate change, people were very cynical about social movements, and my job was to join my peers in collecting signatures for climate justice campaigns to help people understand a little bit more about the issue.

I had a deep interest in climate change and inequalities of all kinds, so I spoke to a lot of people. It was a very nerve-wracking, exhausting activity, but I was strong enough to keep going.

At the end of the shift meeting, I counted the number of signatures I collected, and I often came out on top in terms of the number of signatures, even though I was resting in the bathroom.

But I was always so envious of everyone else, because at the end of their petitioning shift, many of them were just as energetic as they were at the beginning of their shift, and many of them were even more energetic, and they couldn't wait to go to a concert or a dance in the evening.

In my case, no matter how much I liked the band, I could only go back to my tent and go to sleep, because I really didn't have any energy left.

At the same time, my heart was filled with anger.

"This is unfair, I'm an introvert and everything I do offline is for extroverts."

Besides this, I was exhausted from participating in the protest march.

Sometimes I participated in activities in front of embassies and commercial facilities.

They were all very high-volume, high-volume, high-performance, high-volume, high-volume activities.

There weren't any activities for introverts, so my first thought was that it was unfair. One-third to one-half of the world's population is introverted.

And I found that situation frustrating, because there were a lot of successful activities that didn't have to be extroverts.

Not just loud

It's not just what people perform

A lot of the work that was needed was behind the scenes, hidden and invisible.

I ended up becoming an activist because that was the only way I could work. I've been active since college, and for the last 10 years, I've been doing activism as a job for a large charity, and now I'm a creative consultant for a variety of organizations in addition to my other work.

About seven years ago, out of curiosity, I started trying out the quieter forms of social activism that I could do, so that I wouldn't burn myself out of activism, and to focus on what I thought was the problem with activism.

Luckily, when I was working for big organizations like Oxfam, I had the opportunity to read a lot of large-scale research reports about what drives politicians, businesses, and the general public, and what works and what doesn't.

I'm an obsessive person, so I read all these materials and tried to find ways to get people involved in social change in a different way than before.

Today, I'm going to share with you three reasons why social movements need introverts.

There are many other reasons, but I will focus on three.

First, social activism is often short-lived and action-oriented. When extroverts see injustice, they tend to react, "I need to do something now."

I use needlework and other handicrafts, which is what the man in the picture is doing. It gives extroverts the opportunity to sit down and act, and it gives the shy, quiet introverts a way to start a social movement.

Repetitive tasks like handicrafts aren't something you can do quickly, you have to take your time.

The iterative process of stitching is great for thinking about complex, tangled, large-scale problems in social change, and exploring what you can do, as a citizen, as a consumer, as a voter, and so on.

If you just keep sewing, it helps you analyze things critically, and it helps you take a hard look at your motives.

Do you just want to rush to the site even though you don't have any specialized skills?

Is it the purpose of joining the mass movement, or is it a slightly ulterior motive to pretend to be the Savior?

And when we do needlework together, extroverts, introverts, and ambiverts find their own place in the same arena, and because it's a quiet, slow-moving social movement, it's easier for people to be heard on topics that would normally be difficult for introverts to hear.

It may sound strange, but you don't have to make eye contact while sewing.

If you're a shy introvert, you can sit shoulder-to-shoulder with someone, or a few people, and ask them what they're thinking while they're sewing, questions that they wouldn't normally have the time to ask or would hesitate to ask when their eyes meet.

That's why it's easier for introverts to think abstractly and deeply, and say, "I think extroverts doing things like blaming people and popping out are certainly interesting, but who are you going to appeal to? How are you going to do it? Is that really the best way?"

Being able to sit down and have these conversations gives extroverts a chance to slow down and think deeply, while introverts have the advantage of being heard and feeling like they're part of a movement for change.

Some of our activities involve stitching the values ​​that are consistent with our social movement onto cardboard, with the goal of preventing inappropriate behavior.

One example is a collaboration with an arts institution, where more than 150 people gather at the V&A Museum in London, and sit for hours and sew messages about social issues they care about, and then tweet their thoughts and participation reports, like in this picture.

And my theory is that social activism needs introverts, because they're good at engaging social activism.

If there's one thing we've learned this year, it's about what to do when you reach out to people in power. You should listen to those who disagree with you, build bridges instead of building walls and fighting with them, and be a friend with stern advice rather than an aggressive adversary.

One thing I've been very active in working with introverts in large numbers is creating gifts for those in power, instead of yelling and cursing outside, for example, handkerchiefs with messages on them, like, "Don't waste your strength.

use it for good

In a position of power like you, there must be a lot of hardships.

How can I become stronger? ”

The great thing about introverts is that you can write a letter while making a gift like this, for example, when you were planning a campaign to advocate for a living wage against Marks and Spencer.

I made handmade handkerchiefs for the company's 14 directors.

I wrote a letter, put it in a box, went to the annual meeting, handed over the gift, and had a dialogue with the board members as a form of social engagement.

The best part was when the chairman of the board approached us, and he complimented us on what we were doing and told us that it resonated with him.

Some of the most influential people in the industry, like board member Martha L. Fox, who have hundreds of thousands of Twitter followers, tweeted that they were really moved.In less than 10 months, we had a number of meetings with Marks & Spencer and said, "It's hard to get a company to guarantee a living wage, isn't it? that would be funny

For a great company like yours

I want you to be our ideal role model."

This is a form of social movement with deep interaction.

Repeated meetings with the company

For Christmas and Valentine's Day, I sent cards that said, "Would you be willing to consider a living wage?" And less than 10 months later, the official announcement was made that Marks & Spencer had introduced a living wage. (Applause) Thank you.

We're currently helping the company get certified as a Living Wage Advocate, which is very important. Last June, I went to the annual meeting again, met one-on-one with the board, and had a fruitful conversation. said it wouldn't have happened

Introverts are very good at engaging social activism because they're willing to listen, they like one-on-one conversations, they don't like small talk, they like big-scale, challenging problems to talk about, they don't like conflict, they avoid it at all costs.

The third reason why I think it would be a waste not to bring introverts into the social movement is that, as I said earlier, probably half the world's population is introverted, and most of them don't call themselves introverts, and they're shy about telling people that they're being put down by something.

In my case, a few years ago, my mom's emails were in all caps (the same as out loud). Now, things have improved, like using emojis.

The words inside are gentle, so I read them with my eyes closed even though they were in capital letters.

It's a little embarrassing to tell people that they'll be overwhelmed by all the capital letters, but we need the cooperation of introverts to create a compelling social movement that attracts introverts instead of alienating them.

Introverts get put off by big, flashy posters, capital letters, and exclamation marks, because they're desperate to tell you what to do and to get your attention.

One of the things I do with participants around the world is to create impactful little pieces of street art with provocative messages that hang in the eyes of pedestrians.

It is not a content that preaches or instructs people.

The idea is to invite people to engage in different ways, to make them think for themselves, because introverts don't like to be dictated.

There's also an activity where you write what you love on a green heart and put it on your cuff and talk about how climate change is going to harm you.

If asked, have a deep one-on-one conversation and say, "I like chocolate, but...

It seems that it will be affected by climate change, and I think there are many other things that will be adversely affected, so I would like to be part of the improvement rather than the cause."

And since introverts don't like attention, they change the subject and say, "What do you like? How will climate change affect you?"

Instead of "stealing" things from the store, you can also "leave" them, and make small scrolls that tell a nice story about how the clothes came to be.

Is it a fun story? Is it a story that makes you want to cover your eyes?

You can slip a scroll like that into a small pocket at a store, all in lowercase, all handwritten, with hickeys and emoticons, tie it with a ribbon, and people who find it will be thrilled.

They tend to leave it in stores that don't care about social issues, or tuck it in their front pocket. This is one of the ways introverts can engage non-exhaustively -- offline -- but it's also a way to involve other people, both online and offline.

Now, I would like to make two recommendations for both introverts and extroverts.

For ambiverts, everything is relevant.

Extroverts should also think of introverts when planning activities.

The skills we introverts have are just as important as extroverts.

Introverts are good at thinking things through, and figuring out small problems is their specialty.

It's suitable for social movements that involve deep involvement, so please use it that way.

Introverts are also very good at keeping people interested by engaging in subtle, quirky behaviors that generate conversation and thought.

My next suggestion for introverts is that you like to be alone, you like to be in the world inside your head, but the social movement needs you, so come out of your shell every now and then.

That doesn't mean you should turn extrovert and burn yourself out. It doesn't do anyone any good. No, I want you to know that your skills and traits are valuable for social movements.

Whether you're an extrovert, an introvert, or an ambivert in this room, the world needs you more than ever before, and there's no excuse not to get involved.

thank you

(applause)

(Chris Anderson) Can you tell us what machine learning is all about? So that's what seems to be at the heart of the frenzy and anxiety around artificial intelligence, so how does it work?

(Sebastian Thrun) Artificial intelligence and machine learning have been around for about 60 years, but until recently, they didn't have impressive results.

It's only recently that we have the computing power and data sets needed to make machines smart.

Here's how it works

For example, if you wanted to write a program for a smartphone, you would hire a software engineer to write you a very long recipe, saying, "If the water is too hot, turn it down.

If it's too cold, raise the temperature."

The recipe isn't 10 lines or something

can be millions of rows

Today's mobile phones have 12 million lines of code.

Your browser has 5 million lines of code

And if there's something wrong with the recipe, it can crash your computer.

That's why software engineers make so much money.

But now computers can find their own rules.

Instead of having an expert break it down into steps and write rules for every situation, you can show a computer an example and let the computer come up with the rules for itself.

A good example of this is AlphaGo, the Go program recently acquired by Google.

Normally, to make a game play, you would have to write all the rules, but in AlphaGo's case, it looked at millions of games and came up with its own rules and beat the reigning champion.

The good news is that the burden of programming has been pushed to the data, and software engineers don't have to be so smart.

And being able to do that was a big turning point, and embarrassingly, my PhD thesis was on machine learning.

It's not a big deal, so please don't read it. That was 20 years ago, and computers back then had the brains of cockroaches.

Today, it's powerful enough to imitate professional human thinking.

And computers can see much more data than humans can.

AlphaGo considers millions of games,

Humans can't think that much.

Google sees over 100 billion web pages

No one can read 100 billion pages

That's why computers can find rules that humans can't.

(Anderson) So instead of thinking, "I'll do this if my opponent comes like this," you think, "This seems like a winning pattern."

(Slan) Yeah, think about parenting.

You don't spend the first 18 years instilling the rules for every situation and then rolling them out.

Stumble, fall, get up, get knocked down, get hit, have fun, get good grades, and find out for yourself.

And that's what's happening with computers right now, and it suddenly makes programming easier.

You don't have to think about it, just give it lots of data.

CA: So that's the key to the amazing advances in self-driving cars.

You brought a case

Could you please explain what is happening here?

THL: This is what a self-driving car looks like, made in Udacity and spun off as Voyage.

We've trained our cars to be autonomous, using a technique called deep learning, and we're driving El Camino Real, from Mountain View to San Francisco, in the rain, in the presence of cyclists, pedestrians and 133 traffic lights.

A long time ago, I formed a team at Google to develop self-driving cars.

At the time, we would gather the best software engineers in the world and try to find the best rules in the world.

just training here

I ran this road 20 times, and I got all the data into the computer, and after a few hours of processing, I was able to drive better than a human could.

so programming is very easy

Fully autonomous, running 53 kilometers in an hour and a half.

CA: So that big area on the left side of the screen is what the computer sees, and the dots that represent the trucks and cars are moving?

Slan: On the right is the camera feed, which is the primary input that we use to find lanes, other cars and traffic lights.

This car has radar to measure distance.

It's common in systems like this.

On the left is an image from the laser that detects trees and other obstacles.

But now most of the interesting things are done with camera footage.

We're moving from using precision sensors like radar and lasers to using inexpensive, generic sensors.

the camera doesn't cost $8

(Anderson) The green dot on the left is

what does that mean?

THL: That's the reference point for adaptive cruise control, which controls speed based on how close you are to the car in front.

CA: You also have an example of how the learning part works.

Let's listen to the story while watching it

THL: This is an assignment I gave to Udacity students for their "nano degree" in self-driving cars.

I showed them this data and said, "How did you drive this car?"

As you can see from the video, it's pretty hard for even humans to drive properly.

I said, "Let's do a deep learning competition, let's do an AI competition," and I gave the students 48 hours.

Even for software companies like Google and Facebook, this stuff takes at least six months.

So if you can do it in 48 hours, that's amazing.

100 students submitted in 48 hours, and the top four were perfect.

It drives better than I do for this footage, using deep learning.

also in the same way

it's like magic

Computers now figure out the rules themselves, given enough data and enough time to digest it.

CA: And that's what has led to the development of powerful applications in all areas.

You talked about cancer the other day.

Shall we put out that video?

(Slan) Please (Anderson) This is great.

Slan: This is a finding from a completely different field.

It's a highly specialized dermatologist who makes $400,000 a year, and depending on how you look at it, it's either supporting or competing with it.

It takes 10 years of training to become a good dermatologist.

This is a machine learning version of a dermatologist.

using neural networks

"Neural network" is the technical term for these machine learning algorithms.

Researched since the 1980s

Here's one that Facebook Fellow Yann LeCun created in 1988, with a gradual propagation of data, much like the human brain.

It's not the same as the brain, but it mimics it.

It's gradual

The first step is to extract the edges, the bars, the points from the visual input.

The next step is to take out the slightly more complex edges, shapes, half-moons, things like that.

Ultimately, you can compose very complex concepts.

Andrew Ng showed that you can find cat faces and dog faces in huge amounts of images.

A team of my students at Stanford has shown that training an AI on 129,000 cases of skin conditions, including melanoma and carcinoma, can do the job of the best dermatologists.

To test that, we compared the results of the AI ​​and 25 Stanford-certified dermatologists on different data than we used to train the AI.

In most cases, the AI ​​was able to match or exceed the accuracy of a human dermatologist.

(Anderson) About this image

I heard an anecdote

What happened?

Slan: This was last Thursday, and it's an ongoing story.

Earlier this year, I published a paper in Nature about how accurate it would be if I had a dermatologist and a computer program diagnose an image.

All images used are past cases.

It's something that I've done my research on and know the correct classification.

this was wrong

It was diagnosed by a collaborating Stanford doctor.

The collaborator is one of the top three dermatologists in the world, and when he saw the bruise in this photo, he said, "It's not skin cancer."

But then I thought it over and said, "Hey, let's check it out on the app."

I took out my iPhone and looked it up in our app, which should be called a "pocket dermatologist," and it came up with cancer.

If you have malignant melanoma

he was confused

"Well, my iPhone is a little more trustworthy than I am," I decided to have it biopsied.

It turned out to be progressive malignant melanoma.

I think this is the first time we've found a melanoma that would otherwise have been overlooked without deep learning.

(Anderson) That's amazing.

(Applause) There's likely to be an immediate demand for such an app, and a flood of people.

Are you thinking of creating an app that allows people to self-diagnose?

Thran: My inbox is flooded with emails that tell heartbreaking stories about cancer apps.

I've removed 10 or 20 melanomas, but I'm worried that something like this might be overlooked, as well as flying cars and emails asking for lectures.

But I think more tests are needed.

I want to proceed very carefully.

It's easy to impress your audience with shoddy results,

It's hard to come up with something ethically sound.

If people use our app and don't go to the doctor and they make mistakes, I'm very sorry.

We're doing a clinical trial right now, and if that proves it, maybe one day we'll be able to take technology like this out of the university hospitals and out into the world where Stanford doctors can't go.

CA: If I understand correctly, it looks like you're using the collective power of Udacity's students to combine machine learning with collective intelligence in a way that's not how it's done in the corporate world.

Do you think that such an approach might be able to outmaneuver even the largest corporations?

Slan: I have a mind-boggling case that I'm still trying to understand—

What Chris said was the competition we're doing.

We've built a car that can drive itself on the road from Mountain View to San Francisco.

It's not on par with what Google has been developing for seven years, but it's pretty close.

It took two engineers and only three months.

The reason for this was that there were a large number of students participating in the competition.

We're not the only ones using crowdsourcing.

Uber and Didi crowdsource driving

Airbnb is crowdsourcing its lodging business

Now it's being used for a lot of different things, from finding bugs to protein folding and all sorts of crowdsourcing.

Building this self-driving car in three months made me rethink the way companies are organized.

We have 9,000 staff that we've never hired and never laid off.

People you don't even know come to work

And I'll send you 9,000 different answers.

you don't have to use it

We'll only give out prizes to the winners.

I appreciate that they consider it part of their education.

These students are producing spectacular results in deep learning.

Combining great people with great machine learning is really cool.

CA: Garry Kasparov told me on the first day of TED2017 that, to my surprise, it won a chess tournament with a combination of two amateur chess players and three ordinary computers that defeated a grandmaster and a supercomputer, and that's part of the trend.

It looks like what you're talking about made it even more awesome.

Thrun: Yesterday morning, we had two great sessions on AI, called "Robot Masters" and "Human Responses," and there were a lot of interesting things to talk about.

What's worrying is that what AI is actually doing gets mixed up with stories like the threat of dominance by conscious AI.

Consciousness is the last thing we want AI to have

Please don't go into the kitchen and find the refrigerator and dishwasher in love and not keep the food cool because of my bad attitude.

I don't want to buy that kind of product

If you ask me, AI has always been an extension of humans.

it extends and augments the human

Kasparov is just right

The combination of human wisdom and machine wisdom makes us stronger.

The idea that machines make humans stronger has existed since the beginning of machines.

Even with the Agricultural Revolution, steam engines and farm tools didn't do the farming themselves, they didn't replace the human, they made the human stronger.

This new wave of AI will make humanity as a species much stronger.

CA: We'll get to that point later, but let's talk a little more about the fear that people have about AI. People's fear is that computers will rewrite their code.

Let's say your goal is to do well on an intelligence test.

You can try millions of versions, because computers are pretty good at it.

So maybe we'll find something better, and we'll iterate.

So what I'm worried about is that there's going to be a kind of runaway. It's going to be fine on Thursday night, and then come back on Friday morning, and things can suddenly go crazy because of the speed of the computer or something.

let me paraphrase what you said

That's exactly what happened with AlphaGo, where the computer played against itself and learned new rules.

Machine learning is about rewriting rules.

It's a code rewrite

But there is absolutely no concern that AlphaGo will take over the world.

I can't even play chess

CA: Well, right now, everyone can only do one limited area.

you can imagine

I've just seen a computer that can pass college entrance exams. Computers can't read or understand the way we do, but they may take every sentence and find patterns in its meaning.

Couldn't it spread further and have a different kind of runaway effect?

(Slang) That's where I want to draw a line.

It's a possibility, and I don't mean to underestimate it, but it's small and it doesn't occupy my mind, because I think there's something else that's big and revolutionary.

All the successful AIs so far have been very specialized and based on one idea -- huge amounts of data.

The reason AlphaGo is so successful is because of the sheer number of games of Go. AlphaGo can't drive a car or fly an airplane.

Google's and Udacity's self-driving cars feed off of so much data that they can't do anything else.

I can't even control my motorcycle

It's domain-specific, and cancer apps are the same thing.

We've made very little progress on what's called "general artificial intelligence." We don't have an AI that we can ask to make general relativity or superstring theory.

It's in the very early stages

I emphasize this point because I see anxiety and I want to admit it.

But if I think about one thing, the question I want to ask is, "What if we could take something repetitive and make it 100 times more efficient?"

300 years ago, everyone was farming, doing repetitive things.

Today, 75% of people work in offices, doing repetitive things.

we've become spreadsheet slaves

It's not just low-level labor

Dermatologists do repetitive things, and lawyers do repetitive things.

I think the time will soon come when AI will look over our shoulders and make repetitive tasks 10 or 50 times more efficient.

that's what i'm thinking

(Anderson) It's really exciting.

The road to get there can be terrifying for some people. If computers can do repetitive things much better than dermatologists and drivers, as we often talk about now, suddenly millions of jobs will be lost, and society will go through a revolution before we have the bright spot that makes it possible.

Slan: That's certainly a problem, a big problem, and it was touched upon by some of the speakers in the session yesterday morning.

Before I went on stage, I told myself that I was a positive, optimistic person.

Europe has been at war for 140 years, and no one can read or write, and there are no jobs like the ones you do: investment bankers, software engineers, newscasters.

We all went out into the fields and farmed.

Then little Sebastian comes in with a little steam engine in his pocket and says, "Hey guys, look at this.

We can all become 100 times stronger and do other things."

We didn't have a stage like this at the time, but Chris and I were sitting by the cows in the barn, and he said, "I'm very concerned, I milk my cows every day, and what happens when machines do that?"

The reason I'm telling you this is that we have a good understanding of the advances and benefits of the past, like the iPhone, airplanes, electricity, pharmaceuticals.

We want to live to 80, but 300 years ago that was an impossible decision.

But we don't apply the same rules to the future.

When I look back at my job as CEO, 90% of it is repetitive and not fun. I spend four hours a day on repetitive, stupid emails.

I'm desperate for something that will save me from having to do that.

why?

Because I think we're all incredibly creative, especially the TED community.

But even if you're blue-collar, yes. Grab a hotel maid, have a drink with her, and in an hour, you'll probably have a creative idea.

The power of AI will enable us to turn creativity into reality.

What if you could build Google in a day?

What if you could have a beer in hand and come up with what would be the next Snapchat, whatever it was, and be up and running the next morning?

It's no longer sci-fi

What happens next is what history has already experienced.

Freedom from farm work, and later from factory work, created a tremendous burst of creativity and produced a lot of things.

This time it will be even more amazing

And there are some great side effects.

One of the side effects is that things like food and medicine and education and housing and transportation are much more accessible to everyone, not just the rich.

(Anderson) I see.

Martin Ford argues that this time will be different, because in the past, ingenuity has found new ways, but computers will be able to do those things at the same pace.

Do you believe that human creativity is fundamentally different from what computers can do?

Thran: This is something that I strongly believe as an AI expert, but we haven't seen any real progress in terms of creativity and out-of-the-box thinking.

And I want you all to realize what I'm seeing is that the term "artificial intelligence" sounds pretty scary, and there are people like Spielberg who make movies where computers suddenly take over, but it's just technology.

Technology that helps us do repetitive things.

It's the iterative part where you see progress.

to find legal documents

Drafting a contract

Do you want to do a chest x-ray?

Those things are very specific, and I don't think they pose a threat to humanity.

We humans will become superhumans Let's face each other

we made ourselves superhuman

Like swimming across the Atlantic in 11 hours

Take a device out of your pocket and shout to someone in faraway Australia, and they'll shout back in real time from the other side.

You're breaking the laws of physics by doing something physically impossible.

When I do, I'll be able to remember everything I've seen and heard, and everyone I've met.

What were you talking about? (Anderson) Hahaha

(Slan) Our IQ will be over 1,000.

There will be no spelling classes for our children, because there will be no spelling problems.

no more math problems

And what happens is that people can be very creative.

we are creative

It's mankind's secret weapon

CA: Jobs will be lost, and even though it's painful, humanity can do more.

it's a dream

Humanity is lifted to a new level of power and discovery

that it's a dream

Thrun: Think about it, if you look at human history, it's somewhere between 60,000 and 100,000 years old, but most of the inventions, the technology, the things that we're grateful for, were invented in the last 150 years.

Well, books and wheels are a little old, but

Also an ax

But phones, sneakers, this chair, modern manufacturing techniques, penicillin, and many of the things we're grateful for.

In the next 150 years, humanity will discover even more.

The pace at which things are invented is getting faster, not slower.

I think about 1% of the things that are interesting have already been invented.

I'm not ready to cure cancer yet.

I don't have a flying car yet, but I would like to change that.

Flying cars were meant to be made fun of. (Laughter) Isn't that funny? secretly working on flying cars

We haven't doubled lifespan yet.

I don't have a magic implant in my head that gives me the information I want.

It might be scary, but I think you'll love it once you put it on.

I hope so

I feel a little scared

There are many things that humans will invent that have not yet been invented.

No gravity shield Can't beam humans to another location

It sounds silly

200 years ago, experts said it was impossible to fly, and even 120 years ago, if you moved faster than you could run, you would die.

Who says you can't beam people from Earth to Mars?

CA: Thank you very much for your wonderful and inspiring vision.

It was Sebastian Thrun

It was great. (Applause)

Whether they understand it or not, when they surf, they're masters of complex physics.

As soon as a surfer and a surfboard touch the water, the science of surfing begins.

The surfboard's size and light construction help it push water away.

Now a buoyant force equal to the weight of the displaced water pushes the surfer up, canceling the weight of the surfer and the surfboard.

So it stays afloat while the surfer paddles the board and waits for the wave.

So what are surfers waiting for?

Definitely the best waves

Like other waves in physics, ocean waves represent the transfer of energy.

The wind that blows on the ocean accelerates the motion of water particles near the surface, causing ripples to grow and become waves.

An uneven water surface is affected by gravity, which tries to return the water surface to its original flat state.

As waves move through the water, water particles push and pull on surrounding particles due to wave-induced pressure. This movement is timed with the motion of the waves to propagate energy through the water.

The motion of these particles is much more limited than the overall motion of the wave.

Closer to the coast, the seafloor is shallower, so wave motion is confined to a smaller area than in the open sea, and wave energy is concentrated near the surface.

If the shoreline is flat and smooth, the waves will refract and become parallel to the shoreline as they approach the shoreline.

this is an important moment

When a wave approaches, the surfer quickly spins the board in the same direction as the wave and begins rowing with the speed of the wave.

By creating an angle between the board and the water, a dynamic pressure is created under the board that pushes the surfer and board out of the water, allowing them to glide along the water's surface.

At the same time, the increased momentum in the forward direction makes the surfer more stable, allowing them to stand up and surf along the wave.

Now you're catching a wave and you're on a surfboard with your front facing parallel to the coastline.

Thanks to the fins on a surfboard, you can change your speed and direction by shifting your center of gravity.

Above you is a wave crest, where water particles are undergoing maximum acceleration.

Because it moves faster than the wave below it, it overtakes it before it falls under the influence of gravity.

When waves break along the shoreline, they create a characteristic "curl" or "jet" wave.

Sometimes the curled wave completely encloses part of the wave and forms a tube of water known as a "barrel."

The irregular sea bed and the swell of the waves themselves sometimes allow for the legendary 27 seconds of surfing off the coast of Namibia.

And many who manage to ride a barrel wave say that time feels different inside, making it one of the most magical experiences for surfers.

Of course, not all beaches are created equal.

In certain locations, such as Nazaré in Portugal and Mavericks in California, offshore canyons and rocky formations refract and concentrate incoming wave energy, creating the massive waves demanded by surfers around the world.

And for some of these waves to travel for more than a week, swells occur more than 10,000 kilometers from shore.

Sunny California waves may have originated in rough seas near New Zealand.

So even if a surfer isn't conscious of the weather patterns, the tectonic geology, the fluid dynamics of the South Pacific, the art of catching the perfect wave involves all of these things.

And the waves we surf, created by the wind, are only part of the continuous vibration of energy that has shaped the universe since it began.

so let's get started

wait a minute

(Vienna) Ready

(laughs) I'm sorry.

(music) (human beatbox) Thank you

(applause)

On March 3, 1913, the demonstrators gave way to a woman dressed in white, and they didn't miss activist Inez Milholland in a long, drooping cape and riding a white horse.

She was riding a horse to lead a women's suffrage parade, the first mass protest to promote women's suffrage nationwide.

After months of strategic planning and discussion, thousands of women gathered in Washington, D.C.

Here, we called for a constitutional amendment to guarantee women's right to vote.

By 1913, campaigners for women's rights had been working for decades.

As disenfranchised people, we had no say in the laws that affected our lives and the lives of others.

Yet they sought political equality and sought more support.

The last significant victory for women was in 1896, when they won the vote in Utah and Idaho.

That brought the number of states that allowed women to vote to four.

We've got a new addition, Alice Paul, an insider.

She was inspired by British suffragettes, people who went on hunger strikes and endured imprisonment in the early 1900s.

Rather than launching costly state-by-state political campaigns, Paul called for constitutional reform with long-lasting effects that would protect women's suffrage on a national scale.

As a member of the National Women's Suffrage Association, Paul proposed a massive march to inspire and revitalize the movement.

Washington officials initially rejected the proposal, but then began to push the march down a side street.

But Paul overruled the authorities' decision and allowed the parade to take place the day before Woodrow Wilson's inauguration.

It was going to get the most media coverage and the attention of the people in town.

But in planning the march, Paul focused primarily on appealing to white women of all backgrounds, including racists.

They tried to dissuade African-American activists and activists from participating, telling them to march behind the lines.

But far from hiding in the national movement, black women help shape the parade.

On the day of the march, Ida B. Wells-Burnett, a groundbreaking investigative journalist and anti-lynching campaigner, refused to step back in line and marched proudly under the Illinois flag.

Mary Church Terrell, one of the founders of the National Association for the Advancement of Black People, marched with 22 founding members of the Delta Sigma Theta Women's Club, an organization founded by Howard University girls.

Through these and other means, black women were able to stick to their cause despite the deep-rooted hostility of the white women who participated in the movement and the great political and physical risks.

On the day of the march, suffragists gathered to create an exhibit with a powerful message.

The demographic that flocked to the march included international suffragists, artists, performers and business owners.

Parade vehicles appeared in the form of golden tanks and giant Liberty Bells, maps of voting nations.

On the steps of the Treasury building, musicians performed live music to celebrate the historic achievements of women.

The marchers continued marching even as mobs blocked the roads, hurled harsh words at the women, spat, threw cigars, and assaulted the marchers.

Police didn't intervene, and more than 100 women were eventually hospitalized.

Widespread coverage of mob abuses across the country brought the march to the attention of the general public and garnered much sympathy from suffrageists.

National newspapers condemned the police, and congressional hearings investigated their conduct during the parade.

After the protests, the Women's Journal proclaimed, "Washington authorities have lost face. Suffrage equality has triumphed."

In this way, the march led to a surge in support for women's suffrage, which continued in the years that followed.

Suffragists kept pressuring lawmakers, attending rallies and petitioning the White House.

Inez Milholland, a woman on a white horse, constantly toured all over America despite suffering from a chronic illness.

Without seeing the fruits of my efforts

In 1916, he collapsed during his suffrage speech and died shortly afterwards.

In an informal report to the public, her last words were, "President, how long will women wait before they're free?" It took decades for everyone to get the right to vote, but in 1920, the U.S. Congress ratified the 19th Amendment to the U.S. Constitution, which finally gave women the right to vote.

This is the story of an elementary school in Columbus, Ohio.

In this elementary school there was a student named D.

D entered elementary school when he was six years old.

But after a few months, D became irritable and that smile faded.

D overturned desks, threw desks and chairs, yelled at teachers, stood on window sills, walked out of classrooms, and eventually out of school.

Sometimes, this kind of violent behavior brought the school to a standstill, and sometimes it took D an hour or more to calm himself down.

There was no one at school who could help D.

I can say this because I was the principal of this school.

It was immediately clear to me from all the staff that this case was far more extreme than any of the situations we'd been prepared for.

Every time D got rough, I asked myself, What did I miss in the principal education program?

What should I do for a child like D?

How can D not interfere with other students' learning?

I tried everything I could think of, talking to D, taking things up, calling his parents, and the only real option left was expulsion, but I knew it wasn't going to do him any good.

This is not limited to D.

Students all over the world are struggling with education.

I haven't found a fail-safe solution, but I've come up with a simple idea: In order for a child like D to not only manage, but succeed in school, we have to teach them not only how to read and write, but also how to deal with and manage their emotions.

By doing this, we went from being an F-ranked school in one of the lowest performing schools in Ohio to a C-ranked school in just a few short years.

It may seem obvious

Of course, teachers should be aware of the emotional health of their students.

But the reality is, if you're in a classroom with 30 students and one of them throws a desk at you, it's a lot easier to get rid of that kid than to figure out what's going on in that kid's head.

But what we've learned about D, how we've learned how to treat a child like D, is that small changes can lead to big changes, and they can start very quickly.

You don't have to spend a lot of money or have a grand strategic plan, you just have to think smart about what you have and where it's located.

In education, we tend to look for answers externally, but rarely do we invest enough time, money, or effort to take advantage of what we already have.

But in doing so, we can make meaningful change quickly.

Now, what we learned about D-

I wanted to know a little more about what made him so mad.

And it turns out that his father had left home, and his mother had been working long shifts to support the family.

By the way, did I mention that D was six years old at the time?

You can't blame him for dragging home problems into school.

But I had to figure out how to get him out of this crazy emotional problem by teaching him basics like language and math.

Three things helped me the most

First find out where he suffers the most.

Like any young child, the immediate aftermath of school was a difficult time to make the transition, as it moved from the less disciplined environment of home to the more disciplined environment of school.

So I created a calming space for him in the break room.

And as I learned more about D, I learned that there were other ways to calm him down.

For example, D loved helping younger students, so he appointed him as a kindergarten helper and encouraged him to go to the kindergarten classroom and teach him how to write letters.

And in fact, he was able to teach the kindergarteners that the teachers couldn't teach.

Believe it or not, D even calmed some children down, which made us realize that the influence of children on their behavior is much stronger than that of adults.

I also used humor and songs

It might sound silly that a principal or a teacher would genuinely laugh with a child, but you can imagine D's surprise when the principal told jokes, sang radio tunes, and smiled all the time.

Some of you may think it's unrealistic to give all students this kind of special treatment, but we did.

Once they found tools and methods that worked for D, teachers were able to develop them and apply them to other students.

Instead of just reacting to what students do, we become proactive.

When teachers actually planned their lessons, they spent a lot of time thinking about how to recognize their feelings and respond appropriately and appropriately, like counting to 10, holding a fidget spinner, going for a short walk, and so on.

We set aside several times a day to give our brains a rest, and we got them to sing songs, to do yoga poses, to participate in physical activities with rules.

For kids who don't like sitting for long periods of time, we've included flexible chairs. For kids who don't like sitting for long periods of time, we've included flexible chairs, like rocking chairs, exercise bikes, and even elliptical machines, which kids can pedal under their desks.

These changes encouraged children to stay in the classroom and helped them stay focused.

And when there were fewer disturbing children, all the children's behavior improved.

And miraculously, it didn't cost a lot of money.

It's just that we've changed the way we think about what we have.

For example, every public elementary school has a supply line for educational supplies.

Educational supplies can be books, whiteboards, flexible chairs, fidget spinners, or you can paint the walls of your school a more soothing color, which will help your students thrive.

Of course, we spend money on the equipment we use to learn, but of course we spend money on the equipment we use to learn, but we've also seriously considered social means.

The results speak for themselves

By taking children's emotional development seriously and helping them manage their emotions, the children's performance in language and math improved significantly, far exceeding the progress expected in a year and scoring better than other similar schools.

Second, we used external resources to help children control their emotions.

As a poorly funded public school, we didn't have the support staff to deal with the rough situations our children might be facing at home, and we didn't have the training or funding to deal directly with the problems.

So we started reaching out to community groups, community outreach organizations, and even Ohio State University.

Because of our partnerships with universities, we've been able to bring in college students, not just education students, but also school psychology and school social work students.

Each student was paired with a teacher to help the student who was most distressed.

Everyone benefited. Teachers were exposed to the latest college-level educational theories, and students had an authentic, real-world experience in the classroom. Students had an authentic, real-world experience in the classroom.

In partnership with the local Nationwide Children's Hospital, they set up a clinic on campus to provide students with the physical and mental health needs.

And this helped the kids too.

Absenteeism went down, and children were able to get counseling while they were in school.

And perhaps the biggest change isn't D or the kids.

What happened to the adult teaching in the classroom

Teachers are usually good at planning and academic instruction, but teachers are usually good at planning and academic instruction, but when you witness disruptive behavior, you may feel completely out of your business.

But we've gone from a philosophy of exclusion, where if we interfere with a student's emotional development by taking it seriously, get out, to a philosophy of trust and respect.

It wasn't easy, but we really felt that it was an effective way to make a difference, and I admire the teachers who worked with me to make this big change.

As part of a personal development program, I looked at Dr. Bruce Perry's research and studied his research on the effects of different childhood experiences on children's brain development.

What I've learned from that experience is that the experiences of students, such as absenteeism, broken homes, poverty and illness, plant trauma in the developing brain.

yes trauma

It's a very strong word, but it's helped us rethink and understand the behavior we've seen.

These difficult family experiences were real and insurmountable obstacles to furthering our studies, and we had to find a solution.

The teachers continued to implement their lesson plans, focusing on one thing in a short class period to get the students' attention, and they also continued to incorporate exercise breaks, such as jumping around the classroom and dancing for two minutes at a time, because they learned that breaks help students retain new knowledge.

By the way, "Cha Cha Slide" is perfect for a small dance party.

(Laughter) When a teacher asks a student, 'What don't you like? " not

"What happened? ”

Instead of saying, "Get out," say, "What should I do?"

This investment in our children has made a huge difference, and their academic performance continues to improve.

I'm happy to say that by the time D was in fourth grade, he was almost completely out of trouble.

He became the school's leader, and his behavior was passed on to other students.

We have seen and felt that the atmosphere in our schools is continually improving, becoming a happy and safe place, not only for children, but also for adults, despite the external influences, becoming a happy and safe place.

As for the current story, I'm currently working on an alternative education program for high school students who don't thrive in traditional educational settings.

The other day, I asked some students about their backgrounds.

Most of the students, who are 17 or 18 years old, have a history of drug use, or have been in or out of juvenile detention centers, or have been expelled from school.

And what we found was that many of the students were doing the same thing as D, a six-year-old.

So I couldn't help but think, when these students were struggling, if they had learned the right ways to deal with them early on, maybe they could have done better in a normal high school today.

I can't say for sure, but I think it helped.

Now is the time for all of us to think seriously about the social and emotional development of our children.

Now is the time to move forward and say what our children need.

If we teach our children to read and write, and they graduate, but if we don't know how to manage our emotions, what will happen to our community?

I tell them, "If you don't invest now, you'll suffer later.

Now is the time to invest in your children.

They're the citizens of the future, not the numbers that decide whether you pass or fail a test."

thank you

(applause and cheers)

no one wants to make a mistake

but i made a big mistake

Finding out what went wrong led to discoveries that fundamentally changed the way we think about the Earth and the Moon.

I'm a planetary scientist, and my favorite job is making planets collide.

(Laughter) In my lab, we shoot rocks with cannons like this.

(cannon shot) (Laughter) My experiments allow me to recreate the extreme conditions that occur during planet formation.

And in the computer model, you can crash planets as they are, grow them, destroy them.

(Laughter) I want to understand how the Earth and the Moon were created, and why the Earth is so different from other planets.

The prevailing theory about the origin of the Earth and the Moon is called the "giant impact theory."

The theory is that a Mars-sized object collided with the proto-Earth, and a disk of debris around the Earth formed the Moon.

This theory can explain a lot about the Moon, but it's seriously flawed. If the theory says that most of the Moon was formed from objects the size of Mars, then the Earth and the Moon are made of different compositions.

But observations are different.

Earth and Moon are identical twins

A planet's genetic code is represented by the isotopic composition of its constituents.

Earth and Moon have matching isotopes

So the Earth and the Moon are made of the same material.

It's really strange that the Earth and Moon are identical twins.

Each planet is made of different materials, so they have different isotopes, and they have different genes, so to speak.

No other celestial body has such a genetic relationship.

only the earth and moon are twins

When I started studying the origins of the Moon, many scientists didn't quite accept the very idea of ​​a giant impact.

Because this theory doesn't quite explain this relationship between the Earth and the Moon.

We all tried to come up with new ideas

The problem is we didn't have a better idea

Other theories had more serious flaws.

So I tried to save the giant impact theory.

A young scientist in my group suggested that we change the rotation state of the giant impact.

If the Earth spins faster, the materials will mix better and we might be able to explain the Moon.

The reason it was thought to be a Mars-sized impactor was that it would have been possible to form the Moon and bring the Earth to its current rotation period.

This point of view was accepted by many

But what if some other factor determined the length of the Earth's day?

Then there are many other possible giant impacts that could form the Moon.

I was very curious about what could happen, so I simulated a fast-spinning giant impact, and found that it could form a disk of a mixture of the same materials as the planet.

I was so excited

This might explain how the moon formed.

The problem is that this phenomenon turned out to be unlikely.

In most cases, disks are not planets, and the formation of the Moon from this event was an astronomically improbable coincidence, and it was difficult for everyone to accept the idea that the Moon's special relationship with the Earth happened by chance.

Giant impact theory still had problems, and we spent days trying to figure out how the moon came to be.

And it's time for me to realize my mistake

My students and I were looking at the giant collision data under high-speed rotation.

The object of consideration that day was not the moon, but the planets.

The energy of the collision makes the planet very hot and partially vaporizes.

But the data didn't look like a planet.

it was very strange

The planet was strangely connected to the disk.

At this point, I had an intense sense of excitement, that feeling of knowing that the most outrageous mistakes can be very interesting.

Previous calculations assumed that the planet had a separate disk.

I was calculating what the disk contained while trying to figure out if the collision could produce a moon.

It no longer seems so simple

The mistake we made was thinking that planets were always supposed to be planets.

That day, I knew that a giant impact had created something completely new.

I've had many experiences with Eureka,

It's not like those Eurekas out there.

(Laughter) I didn't know what was going to happen.

What was in front of us was this strange new research subject and the challenge of trying to figure it out.

What do you do when faced with the unknown?

Where do you start?

We questioned everything What is a planet?

What happens when a planet ceases to be a planet?

I tried many new ideas

We had to let go of the old ways of thinking, and by experimenting, we threw out all the old data, threw away all the laws of the real world, and freed our minds to explore.

By creating such a mental world, I was able to try crazy ideas and then bring the results back to the real world to test, and this is how I learned.

Trying led to great learning

Combining computer models with laboratory experiments, they were able to discover that after a giant impact, the Earth was extremely hot and had no surface.

There's just a thick layer of gas that gets denser with increasing depth.

Earth may have been like Jupiter

No solids to step on

that was only part of the problem

I wanted to understand the whole problem

We couldn't leave the challenge of figuring out what happened in the giant impact to someone else.

It took me about two years to throw out old ideas and build new ideas to make sense of the data and what it meant to the moon.

discovered a new kind of celestial body

not a planet

made from planets

A planet is an object whose gravity is strong enough to make it a sphere.

All matter rotates together

As you increase the temperature and speed up the rotation, the equator gets bigger and bigger until it hits a tipping point.

Beyond the tipping point, the material at the equator becomes a disc.

At this point, by definition, it's no longer a planet.

The rotation is out of sync, the shape keeps changing as it grows, and the planet is already something else.

We named our discovery "Synestia."

It was named after Hestia, the goddess of hearths and furnaces in Greek mythology, because it was thought that at this time, the Earth was formed as one.

The prefix means "all together," and it's meant to connect all the materials together.

A synestia is a planet whose heat and rotation have exceeded the limits of sustaining a spheroid.

Want to see Synestia?

(Applause) This is a visualization of one of the simulations, but the primordial Earth was already spinning at high speed from the previous mega-impact.

It's distorted in shape, but it's recognizable as Earth because of the oceans on its surface.

The energy of the collision evaporates the surface, mixing the water, air and all the gases within hours.

We've found that many mega-collisions produce synestia, but these bright burns don't last very long.

Eventually it will cool, condense and return to the planet.

During the growth process of a rocky planet like Earth, it probably went through synestia at one or more times.

Synestia has provided a new way to solve the problem of the origin of the moon.

We propose that the moon formed from a giant gaseous synestia.

Vaporized rock condensed - the moon grew under the rain of magma.

The special connection between the moon and the earth was created inside the earth when it was synestia.

The moon may have been orbiting Synestia for several years, so it may not have been visible.

The moon revealed itself when synestia cooled and condensed in lunar orbit.

Synestia settled down on planet Earth after hundreds of years of cooling.

Our new theory is that a giant impact created a synestia, and that the synestia split into two bodies that gave birth to the Earth and the moon, which have the same isotopic composition.

Synestia are made all over the universe.

We used our imaginations to find out. What else am I missing in the world around me?

What am I not seeing because of my own assumptions?

So next time you look at the moon, remember that what you think you know can be the opportunity to make some really great discoveries.

(applause)

African informal markets are typically seen as chaotic and lazy.

When we hear the word "informal," we immediately associate it with something very negative. It can have a huge impact and economic loss, and the profit margins of the informal market alone can fluctuate from 40 to 60 percent.

To study the state of informal markets, we conducted a thorough literature review of all reports and studies of cross-border trade in East Africa going back 20 years.

It was in preparation for a field trip to understand what was wrong with keeping the informal trade in the informal sector.

Going back 20 years, we find that there is no distinction between trafficking and smuggling, illicit trade, and legal but unrecorded trade, such as the sale of tomatoes, oranges, fruit.

By criminalizing this informal trade -- the Swahili word for trade, bishara, and smuggling, magendo -- but English doesn't distinguish between the two, we criminalize the informal sector, and we risk missing out on 60 to 80 percent of annual GDP growth in African economies, because we're unaware of the dynamics that keep Africa's economies running.

The informal market, also known as the "modern economy," is adding jobs four times faster than the traditional formal economy.

It gives employment and income opportunities to what traditional research areas call unskilled workers.

But can you build a machine that makes French fries out of a used car?

So it's imperative that we recognize that we're criminalizing the entire informal sector.

As long as there is a stereotype that the informal market is "criminal," "black," and "illegal," they will not try to incorporate the informal market into the formal market, let alone the global market.

I'm going to tell you about Thearesia, a retailer who turned all our preconceived notions on her head. After 20 years of literature research, she began to question all the preconceived notions that had been so ingrained up to that point.

She sells clothes under a tree in the town of Maraba, on the border between Uganda and Kenya.

Pretty simple, don't you think?

Just hang your clothes on a tree branch, put a tarpaulin over it, sit down and wait for a customer to come.

She fit perfectly into the "informal economy" pictured in literature and research, right down to the point that she was a single mother who started a business to raise her children.

What changed our assumptions?

What surprised us?

First, Thearesia paid the government for the number of days she operated so that she could do business under the tree.

She did it for seven years and kept the receipts.

also record

We're not seeing marginalized, underprivileged, vulnerable African women street vendors.

What we saw, over the years, was a complete retail ecosystem that recorded sales and sourced goods from Uganda.

Do you know how much Thearesia was buying on average each month - new clothes from Nairobi?

1,500 USD

Over the course of a year, about $20,000 was invested in goods and services.

Thearesia is invisible — the hidden middle class.

She's still a fledgling microbusiness in these towns.

Still a fledgling, at least on the wider Malaba border.

A more serious trader could easily run three businesses and invest between US$2,500 and US$3,000 a month.

You can't call someone who receives a receipt a criminal, so the real problem isn't criminalizing it.

the inability to recognize their skilled work

The financial system has no way of recognizing that their work is a microbusiness, let alone knowing that the Thearesia tree has no address.

That's why she can't move

It's slipping past the prerequisites for a formal economy.

I'm sure you know that there are microloans to help African women.

lend me 50 to 100 dollars

But what can you do with that little money?

Thearesia spends 10 times that amount each month on sourcing alone, not including other services and support ecosystems.

They're not the unskilled, marginalized workers who are the target of the usual policies, nor the workers who are seen as part of the middle class, such as white-collar salaried workers and pensionable civil servants.

What you're seeing here is the egg of a small business, the seed that gives life to a business or a company that drives it.

They put food on the table

In this hotel too, the butchers, the bakers, the candlemakers, the invisible people build the machines that fry the French fries and make the beds.

These hidden businesswomen, who cross borders and sell all over the streets, are invisible to data collectors.

And they're embedded in a huge informal market, where smugglers, tax evaders, and all sorts of other criminals don't distinguish between women who work hard, put food on the table, and send their children to college.

that's my wish

It is necessary to start by running

Why not start by recognizing their skills and work?

First, if we allow it, then we can transform the informal market by designing the way that they fit the formal market, the global market, and how they enter and integrate into the whole economic system.

Thank you for your attention

(applause)

I'm sure you've all been fascinated by the romantic mysteries of collapsed civilizations, such as the ancient Maya, Yucatan, Easter Island, the Anasazi, Mesopotamia, Angkor Wat, Great Zimbabwe, etc. Over the past 10 to 20 years, archaeologists have revealed that environmental problems are at the root of the collapse of past civilizations.

But all over the world, there are civilizations that have been developing for thousands of years without any sign of major collapse, such as Japan, Java, Tonga, and Tikopia. The fragility of civilized societies clearly varies from region to region.

Understanding what it is that makes some civilizations more vulnerable than others is very relevant today, because even today we have collapsed civilizations, like Somalia, Rwanda, the former Yugoslavia, and societies that are on the brink of collapse, like Nepal, Indonesia, Colombia.

what about ourselves?

Is there anything we can learn from the past to protect our societies from the kind of decline or collapse that past civilizations have undergone?

Clearly, the answer to this question is not a single factor, and anyone who explains the collapse of society with a single factor is an idiot, because this is a complex problem.

But how can we make sense of the complexity of this subject?

In my analysis of social collapse, I've come up with a five-point framework, a checklist I use to understand collapse, and I'll illustrate that five-point framework with the fall of Norse communities in Greenland.

This is a documented European society, so its peoples and their motivations are well known.

In 984 A.D. the Vikings moved to Greenland and settled there, and about 1450 they perished -- society collapsed and every last man died.

why did they all die? The first of my five-point frameworks is to look at the impact humans have on the environment. Are humans inadvertently destroying vital resources? In the case of the Norse Vikings, they were inadvertently causing soil erosion and deforestation.

So Iron Age European societies were virtually unable to make their own iron: The second item on the checklist is climate change: warmer, colder, drier and wetter.

In the case of the Greenlandic Vikings, in the late 1300s and especially in the 1400s, the climate became colder, but the cold weather is not fatal, because at the same time Greenland was inhabited by the Inuit, who adapted well to the cold climate.

The third item on my checklist is friendly relations with neighboring societies that support a civilization, and if that friendly support is lost, societies tend to collapse. In the case of Greenlandic Norsemen, they traded with their native Norway, and that trade declined, partly because of Norway's weakening and partly because of the sea ice between Greenland and Norway.

The fourth item on my checklist is relations with hostile societies.

In the case of the Greenlandic Norse, the enemy was the Inuit, who were close friends with the Eskimos with whom they shared Greenland.

And the final item on my checklist is the political, economic, social, and cultural factors of a civilization, which have some impact on how societies deal with environmental problems. In the case of the Norse people of Greenland, the cultural factors that made it difficult for them to solve their problems were their devotion to Christianity, which put a lot of money into the church, and their disdain for the competitive patriarchal society and the Inuit. captured according to

What about modern civilization?

For the last five years, I've vacationed with my family in southwest Montana, where I used to work part-time as a teenager harvesting hay, and Montana seems to be one of the most pristine environments in the United States.

But under the hood, we have a serious problem.

See Checklist: Human Impact on the Environment

Yes, it's a serious problem in Montana. The mine waste poisoning problem has cost Montana hundreds of millions of dollars.

Weeds and weed control issues cost about $200 million a year. Montana has also lost farmland to salinity, it has forest management problems, and it has wildfires: Checklist number two: Climate change Yes -- Montana's climate is warm and dry, but most of Montana's agriculture depends on irrigation from the snowfields, and that snow is dwindling.

Item 3: Goodwill that sustains society. More than half of the income in Montana today is not generated within Montana, but rather comes from outside of Montana through Social Security, investments, etc. Montana's standing vis-à-vis other states is weaker.

Fourth: Hostility. Montanaans, like all Americans, are affected by foreign hostile forces, such as oil supplies and terrorist attacks. And finally, the impact of political, economic, social, and cultural attitudes.

For a long time, they were dedicated to logging, mining, and farming, without government regulation, which worked well in the past, but doesn't work today.

So we're looking at these problems of collapse in many societies, both past and present.

Can we draw any common conclusions?

As Tolstoy said, every unhappy marriage is different. There are different broken or in danger societies -- they all have different details, but yet when we compare the civilizations of the past that did or did not collapse to those that are on the brink of collapse today, we can see some common traits. The ancient lowland Maya civilization in the Yucatan, for example, collapsed in the early 800s, literally decades after the Maya reached their maximum population and built their largest monuments.

Also, the collapse of the Soviet Union happened within about 20 or 10 years of when the Soviet Union was the greatest power.

An analogy to this is the cultivation of bacteria in a Petri dish.

It is vulnerable to rapid collapse when resource consumption is out of balance with available resources, and economic spending is out of balance with potential economic power.

Bacteria multiply in a petri dish. Let's say it doubles every generation. Five generations before the last, the petri dish is 15/16 empty. Three generations ago, there are three-fourths left, and the next half is empty.

Yes, this is a common pattern of civilizations reaching their peak and then quickly collapsing.

Mathematically speaking, if you're concerned about today's society, you should focus on the value of the mathematical function, the first and second derivatives, not wealth itself, but on the first and second common denominator. ?

It turns out that nine different environmental factors, some pretty complex, worked against Easter Island, including volcanic ash fall, latitude, and rainfall. Perhaps the most elusive of all, it turns out that the nutrients that protect the Pacific island's environment came primarily from dust particles coming from Central Asia.

Of all the Pacific islands, Easter Island was the hardest to reach for dust from Asia to restore nutrients in the soil, and until 1999, the factors were not understood.

It's for this reason that some civilizations are more vulnerable than others because of complex environmental factors.

Why did the people of Easter Island cut down all the forest?

What did they say when they cut down the last palm tree?

Didn't they see what they were doing? Why didn't society realize the environmental impact and stop it in time?

And as our civilization progresses, I think maybe in the next century people will ask, why on earth did people today in 2003 not see something so obvious and take corrective action?

Just as the past doesn't make sense, people in the future won't understand what we do today. So I'm trying to develop a hierarchical view of why societies can't solve their own problems. Or if you did, why didn't you solve the problem?

We will only touch on two common denominators in this area

One of the dangerous patterns that can lead to collapse is the conflict between the interests of decision-making elites seeking short-term gains and the interests of society as a whole seeking long-term gains, especially if the elites are unaffected by their actions, and if what the elites do to make short-term gains harm society as a whole, then there is a real risk that the elites are doing things that will ruin society in the long run.

Among the Norse peoples of Greenland, for example, in a highly competitive -- hierarchical society -- what the chieftains really wanted was to outmaneuver the neighboring chieftains for more followers, more sheep and more resources.

A similar conflict of interest problem is particularly acute in the United States today, because decision makers in the United States live in gated communities and drink bottled water, allowing them to exempt themselves from their influence. And it's clear that over the past two years, the business elites have accurately recognized that they can increase their own short-term profits by harming society as a whole. In the long run, it's bad for society.

Now, this is the first common denominator of why societies make bad decisions: conflicts of interest.

And another common denominator I want to talk about is that when strongly held values ​​in one society are appropriate in many situations but inappropriate in others, it becomes especially difficult to make "good" decisions that transcend those values. Greenlandic Norsemen were bound together in this difficult environment for four and a half centuries by a shared religious commitment and a strong sense of social cohesion. made it difficult to learn from the Inuit

And Australia today: One of the reasons Australia has survived 250 years on the frontier, far from European civilization, is their Commonwealth identity.

But in modern times, their allegiance to the British Commonwealth is also a barrier to their ability to adapt well in Asia, and it's especially hard to change course when what's causing the trouble is also the source of their power.

What are the consequences of today's situation?

Well, we all know there are a lot of time bombs ticking off in the modern world. Time bombs go off in decades. Everything goes off in 50 years. Some of them will explode sooner in some places. If logging continues at its current rate, the Philippines will be out of its harvestable forests in less than five years, and the Solomon Islands will be in about a year from losing its harvestable forests, which make up the majority of their exports.

And my answer is, the most important thing is to let go of the idea that there is one important thing that we need to do.

Instead, there are 12 problems, each fatal.

And we need to get everything right, because if we solve the 11th problem, but we fail to solve the 12th problem, we're in trouble.

In fact, the path we're on is an unsustainable path, which by definition means unsustainable.

And this result will come out within a few decades.

What this means is that anyone here under the age of 50 or 60 will see how these paradoxes are resolved, and people over the age of 60 may not see the result, but our children and grandchildren will definitely see it.

The outcome will be one of two things: Either we choose to deal with these unsustainable time-detonators ourselves and find a suitable solution, or else these conflicts will leave us with no choice and will be resolved in unpleasant ways: through war, disease or starvation. does that mean? my conclusion is the opposite

The big problems facing the world today aren't out of control. Our greatest threat isn't out of control, like an asteroid about to hit Earth.

Instead, all the big threats we face today are problems that we created, and if we created the problems, we can also solve them.

What exactly is it that we can all do? If you're interested in these choices, there's a lot you can do. There's a lot that we should understand that we don't. And there's a lot that we already understand that we're not doing.

(applause)

I grew up in Europe and was seven to ten years old during World War II.

Few of the adults I knew survived the tragedy of this war. I saw many people who had lost their jobs, their homes, and other sources of support in the war, and were unable to maintain even a peaceful, content, and happy life.

So I became interested in what makes life worth living.

As a young teenager, I read philosophical books, got involved in art, faith and many other things in search of the answer to this question.

Then I had a serendipitous encounter with psychology.

I was in a ski resort in Switzerland, and I didn't have the money to play. The snow had melted, and I didn't have the money to go to the movies.

Well, I can't even go to the movies, so if it's free, I thought I'd listen to the flying saucer story.

The man who spoke that night was very interesting.

Instead of talking about little green aliens, he described how the war had damaged the psyche of Europeans by finding flying saucers in the skies.

By projecting an ancient Hindu mandala into the sky, he said, it was an attempt to bring some order back from the post-war chaos.

i found this very interesting

After hearing this talk, I started reading his book.

Carl Jung was that person, but until then I didn't know his name or his achievements.

Eventually, I went to America to study psychology, and set out to try to understand the roots of happiness.

This graph has been explained by many people, and there are many variations.

In this 1956 American survey, 30 percent said they were very happy with their lives.

That number doesn't change at all from there

Individual incomes have more than doubled, almost tripled over this period when measured against inflation.

Yet the results are the same for happiness: material well-being doesn't seem to be related to a person's well-being once a certain threshold of a few thousand dollars above the poverty line is crossed.

A lack of basic goods, material wealth, is associated with unhappiness, but an increase in material wealth does not increase happiness.

Based on what I've found so far that is relevant to my actual experience, my research is now more focused, looking at where in our daily lives, in our ordinary experiences, where exactly do we feel truly happy.

When I started this research 40 years ago, I looked at creative people: what do artists, scientists, and others think their lives are worth spending their lives on? Many of them may not expect fame or fortune from it, but what is it that still gives life meaning and worth striving for?

This person is one of the prominent composers of American music in the 70's.

The interview is 40 pages long.

This short excerpt sums up a lot of what he said in the interview.

It explains how he feels when his composition is going well.

he describes it as a state of trance

The Greek word for ecstasy means to stand next to something.

It came to be used as a metaphor for a state of mind in which one does not feel that one is performing routine tasks.

Ecstasy is essentially stepping into a different world reality.

It's interesting, if you think about the pinnacle of human feats of our time, whether it's China, Greece, Hindu civilization, the Maya, Egypt, what we know about these civilizations is about their ecstatic worlds, not about their everyday lives.

We know about the temples they built, where you go to experience a different reality.

You know an amphitheater, an arena or a theater

They are remnants of ancient civilizations, where people come to experience the richness and order of life.

This composer doesn't have to go to such a place, this place, the arena here, like the Greek amphitheater, is also a place for trance.

You are participating in a different reality than the life you are used to every day.

But this composer doesn't have to go there

All you need is a piece of paper to write a little piece of music on, and when you're composing, you can imagine combinations of sounds that have never existed before.

So -- like when Jennifer improvised -- he reaches a situation that creates a new reality.

He says it's a very intense experience, and he feels like he doesn't exist.

It may sound like an exaggerated fantasy

But in fact, the human nervous system cannot process more than 110 bits of information per second.

To listen to me and understand it, you have to process about 60 bits per second.

That's why I can't listen to more than three people

Even if three or more people talk to me, I can't understand

Now, if you're in this completely immersive process, and you're creating something new like this guy, you don't have enough attention left to worry about bodily sensations or problems at home.

I don't even feel hungry or tired

His body and who he is disappears from his consciousness, because he doesn't have enough attention left to do something that needs to be focused on and still feel his presence at the same time.

where human existence is forgotten for a while

he says his hands seem to move on their own

But I can't compose, so if I could look at my own hands for two weeks, I wouldn't be awed or surprised. What does that mean?

And in the study of creativity, it turns out that if you haven't been deeply involved in a particular field of technical knowledge for 10 years, you can't be creative.

Whether it's mathematics or music, it takes that long to come up with something that's somehow superior to its predecessors.

Now, when that state arises, he says, the music naturally springs up.

All the people I've asked when I started interviewing -- the interviews were almost 30 years ago -- so many people describe this state as spontaneous flow, so I've decided to call this type of experience a flow experience.

This occurs in various areas

For example, a poet expresses

This research was conducted by my students, who interviewed some of America's leading authors and poets.

In the same way, when you enter this state of trance, you reach a natural sensation without effort.

The poet describes it as a feeling of being lifted into the air when you open the door, which is very similar to how Albert Einstein got the idea when he was struggling to understand how the forces of relativity work.

But it also happens in other activities.

This is another student, Susan Jackson, from Australia, who studied the world's leading athletes.

It's a depiction of an Olympic skater, and it depicts the same thing about an athlete's inner state.

It may not seem natural for you to become one with the music.

Also, in my most recent book, "Good Business," I interviewed several CEOs who were recommended by their peers as very good, ethical and socially responsible.

It turns out that for these people, success is defined as helping others in their work and being happy at the same time.

And as these successful and responsible CEOs say, there's no such thing as only one part of it being successful, if you want to do meaningful, successful work --

Anita Roddick was also one of the CEOs interviewed.

He is the founder of The Body Shop, which is a male of natural cosmetics among cosmetics.

Her passion comes from doing her best at work and being in a state of flow.

This is a very sweet quote from Masaru Ibuka, the founder of Sony. He was just starting Sony, no money, no product -- no product.

His idea was to create a workplace where engineers could feel the joy of innovation, feel a sense of mission to society, and work to their heart's content.

I can't think of a better example of how flow works in the workplace.

So far, our research has conducted more than 8,000 interviews with researchers around the world -- a Dominican monk, a blind nun, a Himalayan climber, a Navajo shepherd -- and they all enjoy what they do.

And I believe that regardless of culture, regardless of education, there are seven conditions that people need to go into flow.

When this point is strong enough, you reach a sense of trance, a sense of clarity, that over time you always know what you want to do and you get instant feedback.

Knowing what needs to be done and doing something that's difficult but possible Losing the sense of time Losing yourself and feeling like you're part of something bigger

If these conditions are met, what you're doing becomes worthwhile in and of itself.

In our research, we can use this simple diagram to describe people's everyday lives.

And you can actually measure this very precisely by giving participants a pager that rings 10 times a day and asking them to record what they're doing, how they feel, where they are, what they're thinking about each time it rings.

It measures two things: how challenging it is that you're experiencing in that moment, and how much skill you're applying in that moment.

Take the average for each person and use it as the center point of this chart.

The person's average challenge and skill level should be different from others.

Anyway, let's center the plot on this chosen mean.

If you know the level of your midpoint, you can predict with great accuracy when you're going into flow -- when the challenge is harder than average and requires above average skill.

You may work in a very different way than other people, but this gateway to flow is for everyone, and it's there when you're doing what you really want to do, like playing the piano or spending time with your best friends.

Now other areas are becoming less and less favorable

This is a good thing because you are challenging yourself in the realm of awakening.

Your skill level isn't as high as it should be, but with a little more skill you can get into flow pretty easily.

Most people can learn from the realm of arousal, where they're pushed out of their comfort zone, and in an effort to get back into the realm of flow, they acquire more advanced skills.

The area of ​​control is also good, again people are comfortable here, just not very stimulating.

It's too easy to call it a challenge

If you want to go from control to flow, you have to increase the level of challenge.

These two are desirable and complementary areas that can easily be moved into the flow.

Moving on to other challenges and skill combinations becomes less and less desirable

Relaxation is not bad, I feel good

Boredom is something you want to avoid. Apathy is very negative. It makes you feel less motivated to do anything.

Unfortunately, many people's experiences lie in this realm of apathy.

Watching TV contributes a lot to this experience, and then sitting on the toilet.

Sometimes when you're watching TV, you might be in flow 7-8% of the time, when it's the show you really want to watch, when there's something to be gained from it.

The question to answer is -- it's about time -- how can we spend more time in flow every day?

we are trying to understand this

Some of you know how to do it yourself without any advice, but unfortunately many of you don't.

Our research is one way to do that.

thank you

(applause)

Why are transgender people suddenly popping up in the world?

(Laughter) As a trans activist, I get asked this question a lot.

Less than 1% of American adults identify as trans.

A recent survey by GLAAD found that about 16 percent of non-trans Americans have a trans acquaintance.

So for the remaining 84%, it's an unfamiliar topic.

But trans people have been around for a long time.

The history of nonconforming sexuality is longer than you might think, and trans is part of that history.

From Central Africa to South America to the Pacific Islands, there are multi-gendered peoples that go back a long way.

The hijras of India and Pakistan are one example, and their existence is also mentioned in the Kama Sutra, written 2,000 years ago.

Native Americans have similar words, and one of the most common words is "having two souls."

Transsexuals were seen as communal healers and healers, but with the spread of colonialism they were taught a different way of thinking.

Trans history research explores trans people and trans ways of being.

For example, women who went to war as men so they could fight in the Civil War.

After the war, most returned to life as women, but some, like Albert Cassia, continued as men.

Albert was eventually institutionalized and forced to spend the rest of his life wearing a dress.

(Sighs) Around 1895, a group of self-proclaimed androgynous people formed The Cercle Hermaphroditos.

Their purpose was to band together to protect themselves from severe persecution by society.

In doing so, they became the first trans-protection group.

By the middle of the 20th century, medical researchers began to do medical research on trans, but behind them were trans patients, one of whom was a trans woman, Louise Lawrence, who had extensive links with people who were arrested for cross-dressing in public.

She introduced sexologists like Alfred Kinsey into the vast trans community.

Other leading figures followed: Virginia Prince, Reid Erickson, and the famous Kristin Jorgensen, who came to public attention in 1952 when she went public with her gender transition.

But while white trans people built their own help networks, many trans people of color had to find their own way.

Major Griffin Gracie and others got into the drag ball path.

Others, so-called "street queens," were frequent targets of police for their free self-expression, and even led important activism in the LGBT rights movement.

These movements led to the 1959 Cooper's Donuts, the 1966 Compton's Cafeteria, and the famous 1969 Stonewall riots.

1970 Two Stonewall activists, Sylvia Rivera and Marsha P. Johnson, founded STAR: Street Transvestite Action Revolutionaries.

Trans people continued to fight for equality under the law, which led to more frequent discrimination, layoffs, arrests, and unchallenged in the face of the AIDS epidemic.

Ever since trans existed, those in power have tried to disenfranchise trans people who live their lives.

This photo, taken in Berlin in 1933, still appears in history textbooks as proof that the Nazis burned works they deemed anti-German.

But among the materials, which is not widely known, was a lot of material from the Institute of Sexual Science.

I organized the trans movement in America, but Magnus Hirschfeld and others in Germany were decades ahead of us.

Magnus Hirschfeld was one of the pioneers of LGBT

he wrote the first book about trans people

Helped trans people get their IDs and get medical attention.

Magnus worked with the Berlin police to end discrimination against LGBT people and hired them in his own institute.

So the Nazi party's burning of his material meant a major setback in trans research worldwide.

This kind of deliberate attempt to wipe out trans people was the first, and certainly not the last.

People often ask me why trans people suddenly came out into the world, but we've been here all along.

These stories should be told with stories buried in the waves of time.

Not only are we not acknowledged, but our suffering is forgotten, and this is why some people see the topic of trans as something new.

I meet a lot of people who think trans activism is just a fad, but there are also allies who, without any ill intent, tell me to be patient, because this activism is "still new."

Imagine how the dialogue would change if we could recognize how long trans people have been demanding equality.

Think you're overreacting?

Should I still wait?

Or, for example, shouldn't we do something about the murdered trans women of color and the still unpunished murderers?

Doesn't our situation still seem dire?

(sighs) Finally, I want trans people to realize that they are not alone.

I grew up thinking that my identity was abnormal and that I was alone.

I was forced to accept the idea that I was different, not knowing that there were other people like me.

If I had known my ancestors sooner, it might not have taken me so long to be proud of my identity and my community.

I'm surrounded by a wonderful, vibrant group of people who can always lift each other up when others don't care. When we hit a wall, we can help each other.That's why even in the face of hardships, we manage to celebrate our existence, love each other, look each other in the eye and say, "You're not alone."

"Because we are with you"

"Never leave me alone"

thank you

(applause)

A shooting star crashed into the earth, revealing a terrifying blob.

It crawls, jumps, glides, and glides

It's unstoppable. Weapons, fire, extreme heat... anything you throw at it will grow and rampage.

It grows very quickly, doubling in size every hour.

But you only get one chance, and after an hour, the blob goes dormant, flattens into a triangle, rests for a few minutes, and then eats again and begins to grow.

You only have one chance to save the planet: sever the blob with a satellite-borne nano-splitting beam.

When the blob is active, it will respawn within seconds.

But when we cut the dormant blob into two triangles, we discover something important.

The sharp triangles -- that is, all angles less than 90 degrees -- die.

It never wakes up again. The obtuse triangles -- that is, those with one angle greater than 90 degrees -- wake up and grow as usual.

Similar experiments have shown that anything other than acute triangles, including right triangles, wakes up.

In the next few minutes, the blob will become an obtuse triangle and sleep.

You can choose any two points on or inside this triangle and cut a straight line between them.

But it only cuts seven times while the satellite is in the sky.

If there's even one blob left to wake up before it makes a full orbit and returns, the whole world will be eaten up.

How can we cut all these blobs into sharp triangles and stop the destruction of the planet?

Pause the video here if you want to think for yourself! 3 seconds to answer 2 seconds to answer 1 second to answer At first glance, it seems possible, but there is a surprising difficulty in finding cuts that do not form obtuse triangles or right triangles.

If you cut it to reach the edge, it will either split into an acute angle and an obtuse angle, or it will split into two right angles.

I feel like I'm destined to keep making obtuse triangles.

But like so many things in life, pizza can give us a clue.

If you square the perimeter of the pizza, instead of a circle, you end up with an octagon.

If you cut it apart, all eight triangles will be acute triangles.

The same is true if the number of sides of the polygon increases.

And the important thing is that polygons with even fewer sides can also work: heptagons, hexagons, pentagons.

Good news, because if you cut off the blob's sharp edges, you're left with exactly the pentagon.

Then, just like you would a pizza, cut the pentagonal blob into five acute triangles.

Completely defeated all 7 cut blobs

You have saved the earth!

Now you know what to do when the giant triangle of immortality appears.

In 2004, a new company called Vima Nutrition began offering people the perfect opportunity to earn as much as a company salary with very little effort.

Vima was open to anyone, regardless of experience or education.

There are only two things you need to do to earn income: buy a set of energy drinks for around 60,000 yen and recruit two new members to do the same.

Vima grew rapidly, expanded its operations globally, and at its peak was gaining 30,000 new members a month.

There was just one problem: in 2013, Vima had $200 million in annual sales, but most of its subscribers were earning less than they paid for.

Vima ended up being sued for a pyramid scheme, a common form of fraud where members try to make money by attracting more members.

Usually founders recruit early members and pitch the formula.

Members are told to recruit new members and are promised to receive a portion of the new member's investment, including the founders themselves.

This type of interaction is repeated for each new member, and the money from the new members is funneled to the top members.

This is different from a Ponzi scheme, in which the founders recruit members and then pass the income on to the existing members, making them think it's a legitimate investment return.

As the pyramid scheme grows, it becomes harder and harder to get new members.

because the number of subscribers is growing exponentially

Let's say a member needs to acquire six new members to make a profit.

It starts with the founders bringing in six people, each of them bringing in six people.

The second generation will have 36 members, each of whom will bring in another 6 new members for a total of 216 new members.

The 12th generation has 2.1 billion members, and they need to bring in another 13 billion people, which is more than the world's population.

In this case, the newest generation of members, 80 percent of the total, would lose all the money they paid.

The reality is that many of the older subscribers will also lose out.

Ponzi schemes are illegal in many countries, but they can be hard to find.

Ponzi schemes take many forms Gift circles Investment clubs MLM—

Ponzi schemes and legal pyramid schemes, in particular, are difficult to distinguish.

The philosophical difference between the two is that in pyramid schemes, members' income is primarily in return for selling tangible goods and services to customers, while in pyramid schemes, the main reward is for recruiting new sellers.

But in reality, in most MLMs, it's nearly impossible for members to make a profit just by selling products.

Also, many pyramid schemes, like Vima, masquerade as legitimate pyramid schemes, using products and services to hide their pay-to-recruit structure.

Many pyramid schemes also take advantage of people's pre-existing trust relationships to enter churches, immigrant communities, and other close-knit groups.

Early members are encouraged to tell everyone how good it was before they actually start making money.

Others in the group follow suit, and pyramid schemes spread, but it's only later that it becomes clear that most people aren't getting any benefit.

It's also common for victims to shut their mouths in shame.

Ponzi schemes invite people to give them opportunities and powers.

That's why people who don't make money tend to blame themselves, not the system, and believe that they didn't get the promised income because they didn't try hard enough.

Some victims get stuck in dozens of pyramid schemes and lose each time.

Despite all these difficult factors, there are ways to spot a pyramid scheme.

Short deadlines are red flags. Beware of claims like "Don't miss this once-in-a-lifetime opportunity. Get started now."

And in a legitimate multi-level marketing scheme, members shouldn't be required to pay for the opportunity to sell goods or services.

Ponzi schemes are very harmful to individuals, to communities, even to nations.

But you can fight back with the same tactics. Send this video to three people you know and encourage them to do the same.

I first learned what patience was when I was six years old.

My grandmother gave me a magic box for my birthday, and neither of us knew it would be the gift of a lifetime.

I fell in love with sleight of hand, and at the age of 20 I became an amateur pigeon handler, a magician.

This trick requires training to make the pigeon sit still and wait in your clothes.

Because of my inexperience, I always had the pigeon appear in a hurry, but my master told me that the secret to the success of this trick was to make the pigeon wait patiently in the tuxedo before finally making it appear-

It required careful patience, something that took years to master.

When I moved to Shanghai seven years ago, it became difficult to put into practice the compassionate patience I had learned.

In China, everyone and everything is busy, and they have to compete to get a better life than the more than 1.3 billion other people.

Manipulating the system, twisting the rules, finding loopholes in the limits.

same goes for food

When it comes to food, impatience can have dire consequences.

In a rush to produce more and sell more, 4,000 years of agriculture in a country rich in natural resources is being undermined by the overuse of chemicals and pesticides.

In 2016, the Chinese government revealed 500,000 food safety violations in just nine months.

Amazingly, one in four people with diabetes in the world are Chinese.

The stories about food felt terrifying and overwhelming, and I told myself that now was the time to embrace my impatience with compassionate patience.

When I say mindful patience, I don't mean the ability to wait.

It means knowing how to act while you wait.

So, longing for the day when a sustainable food system could become a reality in China, I launched China's first online farmer-to-market, bringing pesticide-free, local produce to your home.

When I started this business 18 months ago, the food we were able to sell at the time was pretty awful.

There was no fruit to sell, and very little meat, because nothing was sent to the lab and passed the very strict tests for pesticides, chemicals, antibiotics, hormones.

I told my anxious employees, never give up until you meet all the local farmers in China.

Today we supply 240 different products from 57 local farmers.

After about a year of searching, we finally found a pesticide-free banana growing in the backyard of a village on Hainan Island.

And just two hours from Shanghai, on an island that doesn't even show up on Google Maps, I found a place where cows graze and roam freely under blue skies.

I also worked diligently on logistics management.

We use electric vehicles to deliver customer orders in about three hours, and we use reusable boxes made from biodegradable materials to minimize our environmental footprint.

I am confident that our product offering will continue to grow, but it will take time, and we need more people working together to shape the future of safe food.

So last year, we established China's first food tech backing business and venture backing platform to help start-ups create the future of quality food we all want, whether it's edible insects as a more sustainable source of protein or essential oils that keep food fresher for longer.

You may still ask, why are we trying to create a sustainable food system by taking patient action in a country where taking time is almost considered a sin?

That's because, for me, the real secret to success is patience -- caring patience -- knowing how to act while you wait -- patience that I learned in my grandmother's magic box.

After all, we didn't inherit the Earth from our ancestors.

we borrow it from our children

thank you

(applause)

At more than 100 meters, California sequoias are taller than any of the nearly 60,000 tree species on the planet.

It grows in the misty mountains of the Sierra Nevada, and its sturdy trunk supports the tallest tree in the world.

But even a tree this big seems to have its limits.

No sequoia has ever been recorded that has grown to over 130 meters, and many researchers say it will never exceed this height, even if it can live for thousands of years.

So what exactly is it that stops a tree from growing?

The key is the sap

In order for a tree to grow, it must transport the sugars produced by photosynthesis and the nutrients absorbed by the roots to the ends.

Just as blood circulates in the human body, two types of sap circulate throughout the tree, carrying all the substances the tree's cells need to survive.

One is phloem fluid

The phloem sap contains sugars produced by the photosynthesis of the leaves, so it's sticky like honey and carries the sugars to the tree as it travels down the phloem tissue.

Towards the end, the sieve sap becomes thin like water and collects at the base of the tree.

Right next to the phloem is another tissue, the xylem.

The xylem is filled with nutrients and ions such as calcium, potassium, and iron absorbed from the roots.

At the base of the tree, one side of the tissue contains more of these particles, so the water in the sieve canal is balanced by absorption into the xylem.

This is called osmotic movement, and it creates a highly nutritious xylem sap that moves up the trunk and distributes nutrients throughout the tree.

But there's a wall that stands in your way: gravity.

So the xylem uses three forces to accomplish this very difficult task: transpiration, capillary action and root pressure.

Leaves open and close pores called stomata as part of the process of photosynthesis.

When it's open, it lets oxygen and carbon dioxide in and out, but this hole also serves as an outlet for water to evaporate.

This evaporation is called transpiration, and it creates a negative pressure on the xylem, pulling up xylem sap.

What helps pull the xylem fluid up is capillary action, a fundamental property of water.

In a thin tube, gravity can be overcome by the attraction of water molecules and the adhesion force between water and its surroundings.

Capillary movement is greatest in xylem fibers that are thinner than a human hair.

These two forces pull the sap up, and the osmotic movement at the base of the tree creates root pressure that pushes fresh xylem sap up the trunk.

All of these forces combine to push the sap to dizzying heights, allowing it to carry nutrients and grow new photosynthetic leaves, well above the roots.

But even with systems as sophisticated as this, every centimeter is a battle against gravity.

As a tree grows taller, the water supply it needs to grow begins to diminish.

At a certain height, it can no longer replace the water that evaporates during photosynthesis.

And when photosynthesis, which is essential for further growth, fails, the tree will instead start sending the substances it needs to existing branches.

This model, called the "water restriction hypothesis," is currently the most popular hypothesis for why trees can't grow beyond a certain height, even in perfect conditions.

Researchers can use this model and factors such as growth rate, nutrient needs, photosynthesis, etc., to determine the limits of tree height for a particular species.

So far, no tree has reached this limit, and even the tallest tree in the world has yet to reach 15 meters.

Researchers are pursuing other possible theories, but there may be more than one reason why trees stop growing.

Until we know more, we'll assume that gravity is one of the things that constrains the shape of life on Earth, and tree height is one of them.

1925 On the way home from school in Mexico City, Frida Kahlo's bus collides with a streetcar.

With fatal injuries to her spine, pelvis and lower back, she was bedridden for months.

I put a special easel on my bed so that I could paint while I was bedridden while I was recovering.

When Kahlo starts painting, she begins to paint her unique world.

Kahlo established himself as a creative artist throughout his life, meditating against the background of his extraordinary art.

You may have seen Kahlo's eyes, but in Kahlo's work you can experience the world through her eyes.

Kahlo has painted friends, family, stills and spiritual scenes, but it was her mesmerizing self-portrait that first captured the world's attention.

An early work, Self-Portrait in Velvet, features her strong brows, facial hair, long neck and awe-inspiring eyes.

These traits persist in his later works, but Kahlo began to paint even more extraordinary self-portraits.

For example, "Broken Spine" uses symbolic and religious imagery and a cracked background to represent her physical and mental state.

1928 Kahlo begins a relationship with painter Diego Rivera.

The two became lifelong partners and became known as eccentric celebrities.

Together we traveled the world, devoting ourselves to the arts, to Communist Party politics, to Mexican nationalism.

Kahlo and Rivera share their patriotism as Mexicans and their work to celebrate Indigenous cultures after the Revolution.

In her everyday life, Kahlo immersed herself in the spirit of the natives by dressing in traditional Tehuana dress.

In his work, Kahlo also constantly referenced Mexican folk art, incorporating bright colors and motifs that symbolized death, religion, and nature.

Though Kahlo's work has often been associated with surrealism, with images of large floating flowers, undulating landscapes, transplanted body parts and whirling demons.

Unlike surrealism, which uses dreamlike imagery to express unconscious emotions, Kahlo expressed her own body and life experiences.

The two experiences that Kahlo most expresses in her work were her disability and her marriage.

A bus accident left Kahlo suffering lifelong complications and being in and out of the hospital.

Kahlo often portrayed the effects of physical and mental disability in her work, symbolized by herself struggling to recover from surgery, her back corset, and her wheelchair.

Meanwhile, Kahlo and Rivera's relationship deteriorates, and they both start having affairs.

They divorced once, but remarried the following year.

During this period, Kahlo painted a self-portrait of two people, "The Two Fridas," which conveys the agony of loss and a divided self-awareness.

Frida on the left is broken hearted and blood dripping down her Victorian dress.

It symbolizes an artist wounded by the past, but connected by an artery to a second self.

The second, Frida, is wearing a Tehuana dress, holding a tiny self-portrait of Diego in her hand, thinking of Diego, but not hurting her heart.

Together, these two represent a position between the past and the present, between the individual and the dependent.

1954 Kahlo dies at the age of 47.

Years after her death, Kahlo's popularity continues to grow to this day.

Despite the virality of her work, Kahlo's body of work teaches us that there are no simple truths behind her iconic life, work and legacy.

So Kahlo left her reality in all its forms, giving us a portal into her soul.

"I was just asking for the promotion I deserved, but my boss said, 'Get on your desk and spread your legs.'" "All the men at work wrote down on a piece of paper a list of sexual acts they wanted me to do.

I just asked for an office with windows."

"When I asked for advice on how to get the bill passed, they asked me if I brought my knee pads."

These are just a few of the horrific stories I've heard from women over the last year researching sexual harassment in the workplace.

And what I found out was that sexual harassment is prevalent all over the world.

For the millions of women who are just trying to do their job every day, this is the terrifying reality.

Sexual harassment happens indiscriminately

It doesn't matter if you're wearing a skirt, medical scrubs, military uniform.

Young or old, married or unmarried, black or white

It doesn't matter if you're Republican, Democrat, or independent.

I've heard stories from many women: police officers, military personnel, accountants, actors, engineers, lawyers, bankers, accountants, teachers...

and a journalist

The truth is, sexual harassment isn't about sex.

It's a power thing, something someone does to you in an attempt to take away your power.

What I want to tell you today is that you can take back that power.

(Applause) July 6, 2016 I jumped off a cliff by myself.

I've never been so scared in my life. It was a very painful choice.

Alone in the abyss, I didn't know what was under it.

Then miraculous things began to happen

Thousands of women contacted me to share their stories of pain, suffering and shame.

She told me that she became a spokesperson for these voiceless women.

And suddenly I realized that even in the 21st century, every woman is going through something.

Joyce was the lead flight attendant, and her boss would tell her every day at meetings about the porn she saw the night before, while scribbling dicks on a notepad.

when she complains

I was fired because I was 'crazy'

So does Joanne, a Wall Street banker.

My male colleague calls me every day with the obscene name of my genitals.

When I filed a complaint, I was seen as a troublemaker and was no longer allowed to do business on Wall Street.

So does Elizabeth, an army officer.

Her male subordinates fluttered one-dollar bills and said, "Dance!"

I went to complain to the Major, and he said, "What? Only a dollar?

You're worth at least $5 or $10."

After reading all of these emails, replying to them, and crying over each one, I realized how much work I still have left to do.

Here's a shocking fact: As far as we know, 1 in 3 women have been sexually harassed at work.

71% of these cases go unreported.

I wonder why?

Because when a woman comes forward, she's called a "liar" or a "troublemaker," demeaned, vilified, demoted, blacklisted, fired.

Reporting sexual harassment often means the end of a career.

Very few of the women who have contacted me have kept their chosen jobs, and this is outrageous.

I also kept my mouth shut at first

It happened at the end of my Miss America year, when I met with an executive who was one of the big names in television in New York.

he's been calling people so i think he's helping

I went out to dinner, and suddenly, in the back seat of the car, he covered me and put his tongue down his throat.

I stupidly didn't know what he meant by "doing work" because he was going to get in my underwear.

The same thing happened a week later when I met with a powerful publicist in Los Angeles.

I was in the car again

He grabbed me by the neck and pressed my face so hard against my crotch that I couldn't breathe.

These events rob our lives of confidence.

Until recently, I didn't even call these incidents "assaults."

That's why there's so much left to do

After my stint as Miss America, I had the opportunity to meet many celebrities, including Donald Trump.

In 1988, when this picture was taken, no one could have predicted the situation we're in now.

(Laughter) While I'm fighting to end sexual harassment in the workplace, Trump -- and the president of the United States.

Shortly after this, I got my first television news job in Richmond, Virginia.

She's wearing a bright pink jacket and smiling confidently.

Hairstyle is weird

(Laughter) I was trying to prove that blonde women were smart too.

Ironically, one of the first news stories I covered was Anita Hill's hearing in Washington, D.C.

Not long after that, I too was sexually harassed at work.

I was covering the news in suburban Virginia, and when I got back to my car, the cameraman started saying, when he put me on the mic, he touched my chest and told me how much he enjoyed it.

It only got worse from there

I was clinging to the passenger door, in an era without cell phones.

i was full of fear

I actually imagined how painful it would be to fall out of a car going 80 kilometers per hour, like you see in the movies.

When the story of Harvey Weinstein came out in the open, it was a scary thing to speak up because he's one of Hollywood's most famous heavyweights.

But a lot of women came forward, and it made me feel like what I was doing had a purpose.

(Applause) His excuse was a poor one.

He said he grew up in the '60s and '70s, and he had that kind of background.

There certainly was such a soil, and unfortunately it still exists.

I wonder why?

Because sexual harassment is still associated with many distorted myths.

“Women should change jobs and change jobs.”

is that so

Can you say that to a single mother who works two jobs to support her family and is also sexually harassed?

“Women are the ones who bring their own situation.”

They say that the clothes and make-up that women wear are bad.

The hoodies worn by Uber engineers in Silicon Valley certainly look inviting, don't they?

"Women are lying"

Yes, being humiliated and dragged down is a lot of fun and rewarding, isn't it?

I understand

“The reason women make these allegations is publicity and wanting money.”

The sitting president himself said,

I don't think it was money or publicity that made one of the most famous and richest singers in the world, like Taylor Swift, come forward to have his body groped for just a dollar.

I'm so glad she stepped forward

The news just came in. The untold story of women and sexual harassment in the workplace. Women want a safe, friendly, harassment-free workplace.

That's it

(Applause) So how do we get our power back?

I propose three solutions

1. Make friends with bystanders and those who turn a blind eye

Today, 98 percent of American companies have policies that provide training on sexual harassment.

70% of companies have sexual harassment prevention programs

Yet overwhelmingly, bystanders and witnesses do not come forward.

In 2016, the Harvard Business Review called this phenomenon the "bystander effect."

But remember 9/11

You've heard it millions of times, "When you see something, speak up."

Think about how effective those same ideas might be if we applied them to bystanders of sexual harassment in the workplace. If we had been aware of these incidents and had intervened, if we had stood up to those who perpetrated such assaults, we would have helped and protected the victims.

Calling all men, we need you in this fight.

And all you women - get those who turn a blind eye to your side.

Part 2 Amendments to the law

Do you know how many of you have a mandatory arbitration clause in your employment contract?

It's less

If you don't know, please know here's why

According to Time magazine, as you can see on the screen, "The terms and conditions written in fine print in employment contracts can eliminate instances of sexual harassment."

This is what it is

Mandatory arbitration subject your Seventh Amendment rights to a public jury trial.

this is done in secret

Same eyewitness or affidavit doesn't apply.

Companies often select arbitrators

There is no appeal, and only 20% of cases are won by the employee.

Moreover, this is done in secret, so no one can know what happened to you.

That's why I've worked so hard to push for legislative change in the U.S. Congress.

I'm telling the senators, "Sexual harassment is not a political issue."

No one asks if you're Republican or Democrat before the harassment happens.

it just happens

That's why we should all care

3. Be strong

It all starts with being proud and confident

Stand up and speak up and tell the world what happened to you.

I know it's scary, but let's do it for our children.

Let's end it for the sake of future generations

I've been working hard for my child

Children were paramount in deciding whether or not to come forward.

My beloved children, my 12-year-old son Christian and my 14-year-old daughter Kaia.

I actually missed my child

The day my resolution was announced happened to be the first day of the school year, and I was very worried about what would happen to my child.

When my daughter came home from school, she said, "Mommy, a lot of people asked me what happened to you over the summer."

As she looked me in the eye, she continued, "Hey mommy, I was so proud, I told everyone that it was my mommy."

Two weeks later, when my daughter finally had the courage to stand up to two tough students, she came home and said, "Mommy, you've been brave enough to do it. I've seen you do it too."

(Applause) The gift of courage is so expansive.

May my journey inspire you, because now is the turning point.

We are witnessing a moment that will change history.

More and more women are coming forward and saying, "Enough is enough."

(Applause) My final request is to the business community.

Rehire the women who lost their jobs because they happened to be involved with bad guys.

Here's what I can say about women: We women are no longer undervalued, threatened, or hindered.

never

We stand up and we raise our voices and let the world hear our voices

we become what we should be as women

And above all, we will always be strong

thank you

(applause)

What if more efficient sleep was possible?

As a sleep scientist, this has been a challenge that has fascinated me for the last ten years.

The price we pay for the restless productive society of electric lights and technology is disrupting our natural circadian rhythms and sacrificing the sleep our bodies need.

Our circadian rhythms determine our energy levels throughout the day, and only recently has a global experiment begun studying the circadian rhythms that threaten healthy sleep and, in turn, quality of life.

Because of this change in our lives, we're not getting enough sleep. The average American sleeps a full hour less than they did in the 1940s.

For some reason, there's a tendency to brag that you can get by without getting enough sleep.

These factors combine to create a real health crisis.

Most of us know that lack of sleep causes illnesses like Alzheimer's, cardiovascular disease, stroke and diabetes.

Untreated sleep disorders like sleep apnea make you more susceptible to these conditions.

Did you know about the psychological effects of sleep?

Lack of sleep makes us more likely to make premature decisions, which reduces our ability to empathize.

When you don't get enough sleep, you become more sensitive to your own pain, which naturally makes it harder for you to empathize with others, and it makes it harder for you to be a good, healthy person.

Scientists are beginning to understand how the quality, not just the length of sleep, affects our health.

My research focuses on the stage of sleep that is thought to be the most regenerative: deep sleep.

What we now know, in general, is that there are three stages of sleep: light sleep, rapid eye movement (REM) sleep, and deep sleep.

Electrodes are placed on the subject's scalp, chin and chest to measure each sleep stage.

The brainwaves in "light sleep" and "REM sleep" are very similar to those during waking hours.

But during deep sleep, brain waves are called long-burst waves, and they're very different than when you're awake.

These long burst brain waves are called delta waves.

Insufficient deep sleep impairs the ability to learn and the resilience of the body's cells.

Deep sleep is involved in the process of translating all of your daytime activities into long-term memory and personality.

As we age, we lose these regenerative delta waves.

In a sense, deep sleep and delta waves are markers of biological age.

So naturally, I myself tried all sorts of gadgets and gadgets in my quest for deep sleep, both general and medical, everything I could get my hands on.

I learned a lot along the way, and I realized that what we really need is eight hours of sleep.

I tried to change my circadian rhythm through diet, exercise, and time in the sun, but I still couldn't find a way to get deep sleep.

That all changed when I met Dr. Dimitri Gerashenko of Harvard University.

He told me about a discovery he had read in the literature, which was a German study, that listening to certain sounds at just the right times during sleep could help you sleep more effectively and deeper.

Not only that, but it's also been shown that the sound can improve your memory for the next day.

Dimitri and I teamed up to start working on this technology.

Together with the University of Pennsylvania, we devised a proof-of-concept of this system.

Since then, we've received grants from the National Science Foundation and the National Institutes of Health to develop technology that induces deep sleep.

The research method is as follows

First, in the lab, subjects are hooked up to a variety of devices, and two of them are this one, which doesn't look cool.

(Laughter) When we know that the subject has fallen into deep sleep, we play a sound that has been proven to induce deep sleep, leading them to an even deeper sleep.

I'm going to play that sound now

(sounds like repeating waves) It's a very strange sound, isn't it?

(Laughter) This sound has the same amplitude as your brain waves when you're in deep sleep.

This sound pattern increases the regenerative delta waves that appear in the brain.

The next day, when I asked the subjects, they said they hadn't noticed the sound at all, but they did see an increase in delta waves in their brains.

This is an electroencephalogram of one subject taken in the study.

look below the screen

It's the sound of the amplitude used in the study.

Look at the brain wave at the top of the graph

Now you can see that the sound is inducing more delta waves with regenerative power.

In our research, we found that without connecting the electrodes to a person, it was possible to accurately capture sleep states and induce deeper sleep.

Our research team continues to develop optimal sound and sleep environments to improve people's sleep health.

Sleep's regenerative potential isn't being used to its full potential right now, but maybe one day we'll be able to wear a little device to get even more out of sleep.

thank you

(applause)

Many people think that new advanced technologies will never be born in Africa.

And he said that the best way to develop this continent is through aid and public services that Africa could never do on its own.

So when we see advanced technologies, such as robotics and artificial intelligence, developing rapidly in developed countries, those people feel uneasy about being left behind in technologically backward Africa.

Nothing could be more wrong

I'm a robotics entrepreneur who spends a lot of time here in Africa.

In 2014, we created a company called Zipline, a company that uses unmanned electric aircraft to deliver medicines to hospitals and health centers on demand.

Last year, we launched the world's first nationwide automated delivery system.

where do you think

It's not America, it's not Japan, it's not Europe.

In fact, President Paul Kagame and Rwanda's Ministry of Health have invested heavily in the potential of this technology, signing a deal to deliver the majority of the country's blood supply on demand.

(Applause) Yeah, they're commendable.

So why is blood important?

Rwanda collects 60,000 to 80,000 units of blood for transfusion each year.

Blood is what you really, really need when you need it.

But at the same time, blood is very difficult to work with, because it's very poorly preserved, with a wide variety of storage conditions, and it's very difficult to predict the need for each type of blood before a patient actually needs it.

But the amazing thing is that with this technology, Rwanda can store much of its blood centrally, and when a patient needs a transfusion, it can be delivered to the hospital in just 20 to 30 minutes on average.

want to know how you're doing?

AUDIENCE: Yes, no one will believe it, so let's see for ourselves.

This is our distribution center, about 20 kilometers from the capital, Kigali.

Nine months ago, this place was actually a cornfield, but with the help of the Rwandan government, in just a few weeks, they cleared it and built this center.

And when there's an emergency, the doctors and nurses at the hospital text us on WhatsApp what we need.

Our team will respond immediately

We take blood from the National Transfusion Center, take the molds we need off the shelf, and put them into the system so that the Department of Health knows where the blood is going.

And when the Zip is ready to fire, it accelerates from zero to 100 kilometers per hour in about half a second.

(Audience) Wow!

After leaving the launch pad, it flies completely autonomously.

(Video: Air traffic controller directing) This is an air traffic controller contacting Kigali International Airport.

When Zip arrives at the hospital, it descends to about 10 meters and drops its cargo.

Simplicity is best, so we use a very simple paper parachute that allows you to gently and reliably drop your cargo to the ground in the same place every time.

Just like ridesharing, the doctor gets a message a minute before the Zip arrives, saying, "Please go out and pick up your package."

(Laughter) That's how -- (Applause) That's how doctors get what they need to save their patients' lives.

This is actually watching the delivery from the distribution center, and the drone is about 50 kilometers away.

You can watch drone deliveries to hospitals in real time.

You may have noticed that the drone is sending signals periodically.

This signal is a data packet that uses the cellular network.

Like your cell phone, the drone has a SIM card inside it, and uses the cellular network to report its location and status in real time.

You wouldn't believe it, but I'm on a family plan.

(Laughter) I'm not kidding.

(Laughter) And now, from the suburbs of Kigali, we handle about 20 percent of the blood traffic in Rwanda.

We're delivering to about a dozen hospitals, and we're trying to reach more hospitals.

All of these hospitals receive their blood this way, and most of them request delivery multiple times each day.

In fact, in the field of medical logistics, there is often a trade-off between waste and convenience of pharmaceuticals.

If you want to reduce waste, you need to store all your medicines centrally.

As a result, in the event of an emergency, sometimes we don't have the medicines we need on hand.

If you want to make sure that people who need it get it, you have to stockpile lots of medicines at each facility, and then patients get the medicines they need, but they end up with very expensive medicines.

It's going to be a lot of waste, and the good news is that the Rwandan government wants to keep this cycle going forever.

succeeded in breaking

Doctors have what they need on the fly, so hospitals only need a small amount of blood.

None of the hospitals we work with have expired blood in the last nine months, despite the massive increase in blood product usage.

(Applause) Great results.

This is something that has not been achieved by any other healthcare system on the planet, and this is what happened here in Africa.

But, of course, the patient is the most important part of any discussion about rapid delivery of medicines.

let me give you an example

A few months ago, a 24-year-old pregnant woman had a caesarean section at one of our partner hospitals.

But I had complications and I was bleeding profusely.

Luckily, the hospital had some blood of her type, delivered by regular Zipline service, and the doctors transfused her in several units.

In about 10 minutes, I was bleeding as much as I had transfused.

In these cases, the mother's life is in extreme danger, in any hospital in the world.

But fortunately, the doctors who were treating her immediately got in touch with our distribution center and made an emergency request, and we did emergency deliveries after emergency deliveries.

In the end, we delivered 7 units of red blood cells, 4 units of plasma, and 2 units of platelets.

more blood than all the blood in the body

As a result of all those transfusions, the doctors were able to stabilize her, and now she's doing well.

(Applause) We've done nearly 400 such emergency deliveries since we launched, and there's a story behind most of the cases.

The people pictured here are mothers who have received such transfusions in the last few months.

We always remember, "When you help a doctor who saves a mother's life, you are not just saving her life.

We're also saving babies so they can grow up with their mothers."

(Applause) I want to make it clear that postpartum haemorrhage is not just a Rwanda problem, it's not just a developing country problem, it's a global problem.

Maternal health is a challenge everywhere.

The big difference here is that Rwanda is the first country to tackle this problem with innovative technology.

This is why the attitude that "Africa is collapsing" or "the latest technology doesn't work here" or "we need help" is completely wrong.

Africa can be a disruptor

A small, fast-moving, developing economy can outperform a large, prosperous economy.

Africa can leapfrog directly from a lack of infrastructure to a new and better way.

In the year 2000, if you had predicted that a high-quality mobile network was about to spread across Africa, you would have been called crazy.

But contrary to anyone's expectations, networks are spreading so quickly and empowering people.

Now 44% of Kenya's GDP is transacted through a mobile payment called M-Pesa.

Not only that, but our fleet of unmanned aerial vehicles also uses that network.

Over the next few years, we'll use that mobile payment method to collect shipping costs as we begin delivering to private healthcare facilities.

In this way, innovation leads to new innovations.

And on the other hand, many people in the developed world believe that drone delivery is technically impossible, let alone nationwide in East Africa.

I'm not just talking about Rwanda, but East Africa as a whole.

Just a few days ago on Thursday, the Tanzanian Ministry of Health announced that they will use the same technology to provide instant delivery of a wide range of medicines to 10 million people in hard-to-reach areas.

(Applause) This endeavor will be the largest autonomous delivery system in the world.

I'm going to show you what this is really like. This is one of the first distribution centers.

We have a distribution area within a 75-kilometer radius around the center, so we can serve hundreds of remote health facilities and hospitals from a single distribution center.

But to cover more than 20% of Tanzania's population, you'll need multiple distribution centers.

I actually need 4

And from these distribution centers, hundreds of life-saving deliveries will be made every day, and this system will eventually serve more than 1,000 health facilities and hospitals across the country.

Yes, East Africa is changing rapidly.

And I think what people sometimes overlook is that these leaps can produce compounding results.

For example, Rwanda, by investing in this infrastructure for medical and health care, now has its own air logistics network that can be used to drive change in other sectors of the economy, such as agriculture and e-commerce.

More importantly, the team members we employ at our distribution centers are all local.

They're our Rwandan team, made up of extremely talented engineers and operators.

They operate the world's only nationwide autonomous delivery system.

They've done things that even the most technologically advanced companies in the world have yet to solve.

they really are heroes

(Applause) A perfect hero.

Our team's mission is to bring the seven billion people on the planet access to the health care they need, no matter how difficult it may be.

When we tell them about our mission, sometimes people say, "How generous of you to do such charity."

no! not at all

not associated with charity

We have a commercial contract with the Ministry of Health, so these distribution networks are fully sustainable and scalable.

I really want to correct people's misconceptions because entrepreneurship is the only thing in human history that has lifted millions of people out of poverty.

(Applause) No amount of foreign aid can sustainably employ 250 million African youth.

And most of the jobs that young people might have had ten years ago are being automated or have been radically changed by technological change.

So they are looking for new knowledge, skills, competitive capabilities

and venture business

So why are there so few new businesses entering these global problems facing billions of people in developing economies?

That's because investors and entrepreneurs are completely unaware of this opportunity.

We believe that jurisdiction over these issues rests with NGOs and governments, not private companies.

you need to change that mindset first

You may have noticed something missing in the video I showed you earlier.

How the aircraft will land when it returns to the distribution center.

It may be obvious, but the plane has no landing gear.

No runway for landing

For this reason, it is necessary to instantly reduce the speed of the aircraft from 100 to 0 kilometers per hour.

The method we use uses wires to track the returning craft to within centimeters.

It hooks a plane in the air and pops it onto a cushion so it doesn't break.

So it's kind of like an aircraft carrier combined with a bouncy toy.

(Laughter) So let's see.

(Laughter) (Applause) You may have noticed why I wanted to end with this video.

I wanted to show how children and young people gather at the fence every day.

They cheer every takeoff and landing.

(Laughter) (Applause) Sometimes jet lag causes me to arrive early at the fulfillment center.

If you arrive at the site one hour before the start of operation

I'm already here for the kids to get a better place.

(Laughter) And then I walked up to the kids and said, "What do you think of this plane?"

I answer that it's an "empty ambulance"

they know

they get the point more than most adults

I asked you earlier, who will build the disruptive tech companies in Africa in the next decade?

It's ultimately up to kids like them.

they are for rwanda and for africa

And I'm an engineer for everyone's future.

But for them to be able to create the future, we need to recognize that world-changing companies can grow in Africa, and that disruptive technologies can be born here.

thank you

(applause)

In 1962, Van Doren, who later became editor-in-chief of Britannica, said the ideal encyclopedia should be radical.

But the history of Britannica after 1962 wasn't radical at all, it was a run-of-the-mill type of encyclopedia.

Wikipedia, on the other hand, started with the radical idea of ​​a world where everyone on the planet could have free access to the knowledge of all humans.

I'm in the process of doing that

I just saw a demo of it, a license-free encyclopedia with thousands of volunteers around the world.

I write in multiple languages

We're using the wiki software that I showed you earlier, so anyone can edit and save it instantly, and it's immediately reflected on the internet.

Wikipedia is virtually entirely run by volunteers

Yokai's new way of organizing is exactly what Wikipedia is.

Today I'm going to talk about how Wikipedia works.

Wikipedia is a non-profit organization that I founded, the Wikimedia Foundation, to make the encyclopedia free for everyone in the world.

The goal is to be able to use

It means a lot more than creating a radical new site.

I care about the digital divide and poverty around the world, and I want people to have the information they need to make the right decisions.

There are big challenges beyond the Internet

And that's one of the big reasons we chose the license-free model, because it empowers local entrepreneurs, and anyone can copy it as they please, and redistribute it commercially or non-commercially.

There are many opportunities around Wikipedia around the world.

Wikipedia is funded by donations from the public, and the operating costs are actually very small.

Yokai showed me a graph of the cost of printing presses.

Before showing Wikipedia costs

Let me start with the scale: there are over 600,000 articles in English, two million in total.

Articles are written in multiple languages

The three major languages ​​are German, Japanese and French, while Western European languages ​​are all large.

Many people are surprised that only about a third of all English Wikipedias are accessed.

Many people think that the Internet is mainly in English.

We are global and multilingual.

Ranked in the top 50 most popular websites, ahead of The New York Times

Returning to Yokai's argument,

This blue line represents the growth of Wikipedia, and the other line is the New York Times.

Interestingly enough, the New York Times site, a big corporation, is run by a number of people I have no idea of.

Wikipedia has one employee in charge of our software development.

He just became an employee in January 2005.

Editing and server management

managed by volunteers

It's not the way traditional organizations work, as you might imagine.

Responsibility and Responsibilities

I get asked all the time, anyone who wants to participate can do it.

very quirky and chaotic

There are currently over 90 servers in 3 locations

We have online volunteer system administrators

Day or night, when I connect to the internet, about 10 people are waiting with questions about the server, etc.

Impossible for a company

You can never have a team on standby all the time like Wikipedia does.

With 1.4 billion page views each month, it's grown tremendously.

All managed by volunteers

Bandwidth is about $5,000 per month and that's our

is a basic expense

Can operate without employees

I hired Brian, who was doing Wikipedia all the way through and living part-time for two years, so I could make a decent living and go to the movies.

Having such a chaotic organization raises questions about the finish.

It's not perfect, but it's pretty good

It's more than you'd expect for a completely chaotic model.

If you edit my page like crazy, you'll think I'm nothing but trash.

When it comes to quality testing, compared to traditional ones, Wikipedia is an easy win.

A German magazine compared German Wikipedia, which is much smaller than English, to Encarta and Brockhaus, and we won across the board.

They hired an expert to compare the quality of the articles, and the results were to our satisfaction.

I'm sure many of you are familiar with the Bush Kelly controversy on Wikipedia.

This was also widely covered by the media.

It all started with an article in Red Herring magazine.

The reporter who called me wanted me to say that the election was heating up and dividing the community.

In fact, "it's not even controversial"

Told

That's not right. That item was edited frequently.

It's true that we've had to protect articles several times.

"Sometimes extreme measures were required, and Mr. Wales protected the Kelly and Bush story for much of 2004," Time magazine wrote.

I told the reporter that sometimes we protect stories, and that's how it was written.

In fact, most things that are considered controversial on Wikipedia aren't even controversial at all.

Many controversial articles get edited, but they're less controversial within Wikipedia.

because most people understand the need to remain neutral

It's not a right-left conflict, as most people assume, but a conflict between those who think and those who don't.

Those types of people are on both sides of the political spectrum.

About the Bush-Kelley controversy, the story was actually protected less than 1% of the time in 2004, not because it was controversial, but because of the ubiquitous vandalism.

Some reporters have tried vandalizing Wikipedia and were surprised at how quickly it was fixed.

I always ask you to stop

Now how about Wikipedia

Quality control system

as to what's going on

There are several factors, mostly social policy, some software related.

The most important thing is to remain neutral

This is the very first thing we agreed upon, and it's a core principle of the community, and there's no room for debate.

It's a social concept of cooperation, so we don't talk much about truth and objectivity.

Trying to write only the truth doesn't help much in deciding what to write, because everyone's perception of the truth is different.

But the term neutrality has a long history within the community, where instead of offering Wikipedia's own views on controversial issues, it's the practice of a reputable group.

based on stating an opinion

A policy of neutrality is important for a very diverse community to come together and achieve something.

So the political, religious and cultural contributors are very diverse.

By sticking to this neutrality policy right from the start, everyone can work together without falling into an endless war between right and left.

Any behavior contrary to this will be asked to leave the community.

Members are always evaluating each other

All changes will be posted on the "Recent Changes" page

As soon as you change it, it will be posted on that page.

The latest update page is also on the IRC channel, it's a chat channel on the internet, and it's monitored by a lot of software.

You'll get an RSS feed and you'll be notified of changes by email.

Users can create their own watchlists

My page gets vandalized from time to time, so I'm on a watch list of quite a few volunteers.

Someone immediately notices the change and just undoes it.

For example, on certain pages on Wikipedia, as soon as a new page is created, you can see that page.

This is an important feature because it removes a lot of new pages that are useless like ASDFASDF(bullshit) etc.

But new articles are also the most interesting things on Wikipedia.

When one person starts an interesting article, it inspires other people to get involved and improve the article.

Editing by anonymous users is one of the most controversial and interesting parts of Wikipedia.

Chris was able to update without logging in. He went to the site and made the changes.

But anonymous users only edit 18% of the total.

What's remarkable is that a tight-knit group of 600 to 1,000 people who are in constant contact edit most of the web.

Over 40 IRC channels and 40 mailing lists

We all know each other, keep in touch, and have meet-ups

They're the people who make most of the site, and in a way, they're kind of near-professionals in their field.

The quality we set is professional level or better.

Even if you can't always meet that level

And that's the goal: a tight-knit group of people who care about the site, and some of them are the smartest people I know.

may not be convincing

It's true, people who write encyclopedias for fun tend to be very smart.

There are various tools that allow you to monitor the community itself and all of its content.

You can see that this was redacted from the history example of the flat earth page.

The strength of this page is that the changes are immediately visible.

One day, you edited my page and saw an anonymous IP number.

I wondered who it was and looked

The changes are immediately highlighted in red, so you can see where they've changed.

Here's a tool that allows you to instantly monitor your page's update history.

Other than that, within the community, we allow a lot of freedom in everything.

Most of the social rules and ways of working are all just on wiki pages.

No software restrictions

No software to enforce rules

As an example, here's the takedown vote page

Regarding ASDFASDF earlier,

Such cases will be deleted by the admin

this is out of the question

Things that don't even need to be included in encyclopedias and things that don't have confidence in the information—

There are many pranks and things that are unknown whether they are true or not.

So we needed a social way to answer that.

So a natural way out within the community was the takedown vote page.

A concrete example here is the movie Twisted Issues, where the first person says, "This might be a movie, but it didn't pass the Google test."

Because the Google test is whether or not you can find Google, and if Google didn't have it, it probably wouldn't exist.

It's a good stepping stone for immediate investigation.

When a person says, "There's no need to post it, so please delete it."

Another person says, "Wait! It's in 20 must-see underground movies."

Others say, ``It's in the movie database, so stay there.''

The fun part here is that the vote is a sentence written on the page.

This is more of a conversation than a vote.

At the end of the day the admins will read this and delete 18 people save 2 people decided to delete

But sometimes 18 people delete, 2 people save, and then they save. The last two people who voted to save found information in a book or link and asked not to delete it because they'll edit it later.

It also matters who voted.

this is a close-knit community

You can see Rick's comment below

Rick is a well-known Wikipedian who voted for trolls and pranks to be removed.

He does a tremendous amount of work, and he knows all about management, and his voice is influential within the community.

about how to govern

Many people want to know about admins

Wikipedia's community governance model looks complicated, but we've managed to come to terms with it. Most opinions aren't necessarily neutral, so we try not to vote on content.

You do not have the right to delete the page

They have to follow the rules too, but they

He's chosen by the community, although sometimes people criticize him for choosing administrators to bias the content of the encyclopedia.

I don't even know how they were chosen, so I always laugh.

You can see a certain amount of aristocracy

Somehow you can tell that Rick's voice is stronger than that of strangers.

I tell this story from time to time with Angela, who was re-elected as a trustee of the foundation with more than double the votes.

"You can do whatever you want on Wikipedia," I always tease her because she's a recognized powerhouse.

But the irony is that Angela gets the role because she knows she'll never break Wikipedia's rules.

She's the only person who knows all the rules of Wikipedia.

The monarch in the community is my role

I explained this in Berlin, and the next day the newspaper headline read, "I am the Queen of England."

I didn't say that, it's just my role in the community, and there's a long tradition in the free software world of having a benevolent dictator model.

So in major free software, there is one undisputed culprit, the benevolent dictator.

I don't like the sound of a philanthropic dictator, and against the future of human intelligence gathered by people all over the world, dictator is my job and role in the world of ideas.

i don't think it's appropriate

But we still need a certain monarchy, and sometimes we have to make decisions, and we don't want to get stuck in the process of making formal decisions.

To give you an example of why or how this is important, recently a neo-Nazi looked at Wikipedia and said, "This site's Jewish conspiracies are disgusting! Delete articles you don't like.

Wikipedia has a voting system, so send 40,000 members to remove this page - let them vote.”

18 of them were gathered

That's about it

They always think they have 40,000 members in that situation.

I finally got 18 people together and plotted something silly to delete a perfectly valid article.

Of course, the vote was about 85 to 18, and there was no threat to our democratic process.

On the other hand, some people are worried

If a group is seriously organized

What if I try to vote? I say

I replied that I would just change the rules

It is my role to say that we will not allow the quality of content to be compromised for the sake of openness and freedom.

As long as people trust my role, that's where I fit in.

Of course, it's license-free, so if I do something bad, the volunteers will leave without complaining, and I can't give orders to anyone.

Finally, I'd like to give you a sense of how Wikipedia operates, and I want you to understand that the Wiki model is how we do it, but we're not fanatical anarchists on the web.

They're very flexible in their social methodologies. The passion that the community has is for the quality of the output, not necessarily for the process.

Thank you. (Applause) Ben Saunders.

You said that fairness is the key to Wikipedia's success.

I think the textbooks that are used to educate children are inherently biased.

Do you know any teachers who use Wikipedia? And what are your thoughts on how Wikipedia is changing education?

Wikipedia is starting to be used by many teachers

I think the press story about Wikipedia is wrong.

It's the same scenario as "Blogs vs. Newspapers."

There's this amazing thing called Wikipedia, but it's been reported that scholars and teachers hate it, but that's not true.

I got an email from a journalist asking why scholars hate Wikipedia.

I'm replying from the Harvard email address that I was recently selected as a Fellow of.

"Not everyone hates it"

But I think it has a big impact.

I'm personally very much looking forward to it - I have a plan to create textbooks in all languages ​​- the Wikibook project.

this is a much bigger plan

it will take 20 years to complete

But it also fulfills our mission to provide an encyclopedia for everyone on the planet.

We're not going to spread CDs indiscriminately like AOL.

It means providing tools that everyone can use.

For many people in the world, giving them an encyclopedia written at the university level is useless if they don't have the comprehension materials to help them use it.

So the Wikibook project is making that effort.

Even if we don't make it, I think there are all sorts of big technological innovations on the horizon.

But license-free textbooks are the next big thing in education.

Oh that's amazing! Look at this amazing formula, I like it

18 minutes from now, I'll explain the beauty of particle physics without formulas as much as possible.

Coral has a lot to learn

It's a very beautiful and unique creature.

Coral projections are collections of countless polyps

Polyps repeat budding and branching to create duplicates with the same genes.

Let's pretend this is a highly intelligent coral, pick one individual, and ask it a question that interests you.

Why are you in that exact position, unlike everyone else? Just a coincidence? fate or something?

Polyps will complain about global warming and then say it's a stupid question.

Coral can be mean

The polyp continues, "The polyp next door is a perfect replica of me. I

Exist in all places at the same time and experience each.”

Because it's natural for corals to branch into many copies,

Unlike humans, they understand quantum mechanics like highly intelligent corals.

The mathematics of quantum mechanics accurately expresses how the universe works.

We find that reality continues to diverge into many possibilities, just like coral.

Humans have a hard time understanding this because they only experience one possibility.

Schrödinger's cat was the first to show the strangeness of quantum mechanics.

if it's a cat

(Laughter) You'll like this one better. (Laughter) Radioactive material and Schrödinger in a box.

(Laughter) On the one that emitted the poison, Schrödinger died.

remains alive in the other reality

The two realities are experienced separately by each Schrödinger.

Each world has no other world

It's strange because you can only experience one reality and you can't see another.

Like Schrödinger, we branch out into many possibilities like corals.

As the mathematics of quantum mechanics tells us, this is how the microscopic world works.

In a nutshell: "Everything that can happen happens"

this is quantum mechanics

But it doesn't all happen

Other physics tells us what happens and what doesn't.

Physics tells us that it all comes down to particle interactions and geometry.

Something happens only when the interactions are perfectly balanced.

How to know the particle, the entity, how the equilibrium works.

In this device, beams of protons and antiprotons are accelerated to near the speed of light, collide, merge, and emit pure energy.

It's converted into subatomic particle emissions that are analyzed by detectors and computers.

This gigantic LHC accelerator, located at CERN in Geneva, has a 27-kilometer circuit, and when it's running, it consumes five times as much electricity as the city of Monterey.

We can't predict which particles will be born in each collision.

Quantum mechanics is all possibilities

The physics, which should be real, show the particles that can be generated.

The energy of the produced particles is always equal to the energy carried by protons and antiprotons.

Particles above this energy limit are never born and cannot be seen.

That's where this new accelerator is amazing.

The energy limit is seven times higher than before, and new particles are easy to find.

Before we make any predictions, let me explain the known elementary particles.

It's the so-called "particle zoo".

electrons are familiar

Everyone is living a good life using this (laughs).

Electrons have a neutral companion, the neutrino, which has no charge and has a very small mass.

Up quarks and down quarks have enormous masses, and together they make protons and neutrons, which are elementary particles of matter.

Antiparticles with clockwise and counterclockwise rotations and opposite charges are their companions.

There's an unfamiliar second and third generation of familiar elementary particles that have the same electric charge as the first generation, but much more mass.

Subatomic particles of matter interact with subatomic particles of force.

The "electromagnetic force" interacts with charged matter, mediated by elementary particles called photons.

There are also very weak forces, simply called "weak forces".

Only interacts with left-handed matter

The "strong force" acts on quarks. Quarks have a charge called color charge, and there are three types of color charge: red, green, and blue.

This naming is a mistake of Marie Germain.

And finally, gravity, which interacts with matter via mass and spin.

Most importantly, each force corresponds to a different charge.

The four forces act on matter according to the charge of each elementary particle corresponding to that force.

The Higgs boson, which is undiscovered but certainly exists, gives mass to other particles.

The main purpose of the LHC is to discover the Higgs boson, which is almost certain.

The greatest mystery is what else we can discover.

I'm going to tell you about one great possibility.

There are 226 elementary particles if you count the spin and charge.

there are many

It seems strange that there are so many different subatomic particles in nature.

Drawing based on charges reveals beautiful patterns

The closest thing is electric charge

An electron's charge is minus one A quark's charge is a multiple of 1/3

Two up quarks and one down quark make up a proton with a total charge of +1.

Elementary particles have antiparticles with opposite charges.

Electric charge is a combination of two other charges: hypercharge and weak charge.

If you expand the hypercharge and weak charge into a two-dimensional charge space and plot the charge on each particle, the charge is shown vertically.

Electromagnetic and weak forces interact with matter based on hypercharges and weak charges.

This is an electroweak unified model unified in 1967.

What's familiar is just electric charges, not both, because of the Higgs boson.

The Higgs on the left is so massive that it breaks the symmetry of the electroweak pattern.

It increases the mass of weak elementary particles and weakens the weak force.

Since the massive Higgs is positioned horizontally in the diagram, the photons responsible for the electromagnetic force have no mass and interact with charges vertically in the charge space.

Electromagnetic and weak forces are represented in two-dimensional space as patterns of charges on elementary particles.

If you develop the strong force in two charge directions and draw the elementary particle charge of the force acting on the quarks, you can introduce a strong force.

We can draw the charges of all known subatomic particles into a 4D charge space and project them into 2D.

When elementary particles interact, they are perfectly balanced in four directions of charge.

When a particle and an antiparticle collide, energy is released and the sum of charges in all four charge directions becomes zero.

As long as the energy is the same and the sum of the charges is zero, you can make anything.

For example, this weak force particle and antiparticle are born in a collision.

Further interactions will always balance the charges

The weak force decays into electrons and anti-electron neutrinos, but the sum of the three charges remains zero.

always perfectly balanced

The charge pattern is not only beautiful

Read what interactions can occur

If we rotate this charge space in four dimensions, we can see strong interactions, hexagonally symmetrical.

In a strong interaction, say, this strong force particle interacts with, say, this green colored quark to become this red quark with a different color charge.

Atoms in the body undergo countless strong interactions every second that keep the nuclei together.

It doesn't end with just 4 types of charges corresponding to 3 types of power.

2 charges corresponding to gravity can also be introduced.

At this time, each elementary particle of matter has two upper and lower spin charges.

All are divided into a 6-dimensional charge space and draw a beautiful pattern

If you rotate the pattern in six dimensions, it's pretty neat.

This is consistent with the most influential idea that shows the mechanism of nature on a microscopic scale of the elementary particle level.

certainly match

We've already hit the limits of our equipment with some particles.

This pattern reveals particle physics at the microscale, and the way the universe works at the microscale is so beautiful.

I will tell you about the unknown world, old and new.

I'll try to extend the pattern using only mathematics and see if I can get the big picture.

I want to find all the elementary particles and forces that perfectly describe the universe.

I want to predict new elementary particles found in higher-energy experiments.

In particle physics, there has long been the notion that this known charge pattern, which lacks symmetry, is the result of the collapse of a perfect pattern, like the Higgs boson breaking the electroweak pattern to create an electromagnetic force.

It's similar, and that requires introducing new forces and charging directions.

Introducing a new direction of charge reveals the charge of the elementary particles, allowing them to rotate with the rest.

If done well, it can be said that the standard charge of the 6-charge dimension breaks the symmetry of the more beautiful 7-charge-dimensional pattern.

This choice corresponds to the Grand Unified Theory put forward by Patti and Salam in 1973.

If you look at this new unified pattern, there are two holes that seem to lack elementary particles.

An example of a successful unified theory

Physicists look for large, symmetrical patterns that contain proven patterns.

We can predict the existence of unknown elementary particles from large patterns.

From this unified model, we can predict two new force particles that are very similar to the weak force, just the weak one.

Rotating the charge group in seven dimensions reveals a strange fact about matter particles: when we look at matter particles in six-dimensional charge space, the charges in the second and third generations are exactly the same as in the first generation.

Indistinguishable with 6 charges

Overlap in standard charge space

But if we think in an eight-dimensional charge space, we can assign a new, unique charge to each elementary particle.

Let's rotate it in eight dimensions and see what the pattern looks like.

The second and third generations of matter are linked to the first generation by a symmetry called "tripleness."

The peculiar charge pattern shown in eight dimensions is one of the most mathematically beautiful geometric patterns.

It is the pattern of the largest exceptional Lie group E8

This Lie group draws a smooth curve in 248 dimensions.

Each point in that pattern has the same symmetry as this complex, beautiful shape.

A part of the E8 shape shows the distortion of space-time in Einstein's theory of general relativity, which explains gravity.

Combined with quantum mechanics, this geometry can explain all of how the universe works at the microscopic scale.

This pattern, which exists in an eight-dimensional charged space, is of unparalleled beauty. It's a collection of countless possible interactions between particles, each of which forms one facet of a complex shape.

Rotate it and you'll see a lot of intricate patterns.

With a certain rotation, we can look down on the 8-dimensional pattern along the axis of symmetry and get a bird's-eye view of the subatomic particles.

It's very beautiful, and like any unified model, you can see the voids for new particles.

There are 20 of them here, two of which are particles of patty and salam.

Based on its position, the new particles should have a scalar field like the Higgs boson, but they carry color charges and interact with strong forces.

If you fill it with new elementary particles, you'll have a complete E8.

This E8 pattern has a very deep mathematical foundation

When it comes to mathematically the most beautiful structures, many people

I feel that the prospect of this mathematically stunning pattern showing the interaction of elementary particles at a microscopic scale is wonderful, and the idea that mathematics can explain nature

never new

In 1623 Galileo said, "Nature's sublime canon is always open to observation and can be described in mathematical terms.

Its elements are geometric shapes such as triangles and circles, or else we will wander in a dark labyrinth beyond human comprehension."

Believing this, I followed Galileo and tried to express the mathematics of particle physics using only geometric shapes such as triangles and circles.

While working with other physicists, this math seemed like a dark labyrinth.

When I touched the essence, I was reminded of the pure and beautiful geometry.

Combined with quantum mechanics, we can describe the universe as a growing E8 coral, where subatomic particles interact with each other in every possible way, based on beautiful patterns.

As we begin to see more patterns with newer instruments like the LHC, it will become clear whether nature follows the E8 pattern or not.

This quest is a great adventure

If the LHC finds particles that match the E8 pattern, you'll think you've done it.

Finding a new elementary particle that deviates from the pattern would be very interesting, but E8 theory would be a problem.

I personally find it difficult

(laughs) How much?

Pretty bad!

(Laughter) The game of predicting how nature works

The risks are high, and this theory and others are gambling.

I'm passionate about it, knowing that most of the time it's going to end in failure.

Theoretical physics is full of failures

A new physics theory looks just like a start-up

It's hard to quit research after making a big investment and failing.

But if science doesn't work, we need to switch

Maintaining life balance and perspective is the only way to stay sane and happy while feeling anxious.

I try to maintain balance in my life

I've been doing my best (laughter). I'm keeping a balance between physics, love, and surfing. These are my three charging directions.

(Laughter) So even if physics didn't pay off, I think I had a good life.

I try to live in a beautiful place

I've spent most of the last 10 years on Maui, and it's such a beautiful place.

For my parents, one of the biggest mysteries in the universe is how they managed to survive all that time without ever having a job.

(Laughter) I'll let you in on a secret.

this is

This is the view from my workroom in Maui.

All beautiful views are similar, but in slightly different places.

Because this was my home and my place of work on Maui.

(Laughter) It was a different life.

I was able to use my time freely by living without rent.

The nomadic life was hard at times, but I lived in a beautiful place, and I was happy and balanced.

I also played a lot with highly intelligent corals.

It's nice to meet someone with high intelligence

It's an honor to have you here today.

Thank you. (Applause)

(Chris) Only 2% understood, but that's good. You might think it's a stupid question.

Your theory of everything is (Garrett) coral.

(Chris) It's interesting that

Because if you're right, gravity and quantum theory merge.

Should we assume that the nature of the universe has the smallest thing - something like E8 that shows possibilities?

So what we measure at the smallest scale

Are you assuming? Garrett: The pattern that I showed you, which corresponds to the conventional theory of particle physics, already has very nice shapes.

the sure part

Later we'll see how that shape fits into the E8 pattern, which has a lot of similarities.

That pattern of dots is a good example of the symmetry of this higher-dimensional model, which distorts, moves and bounces beyond the space-time we experience.

This is all elementary particles

Chris: My understanding is that string theorists describe electrons as tiny, vibrating strings, and you hate string theory.

How should we think of electrons in relation to E8?

(Garrett) is one of the symmetries of the E8 shape

When that shape moves beyond space-time

Twist occurs in the direction of twist that accompanies the movement

(Chris) How does the size of the E8 shape relate to electrons?

I need that to understand Big? small? (Garrett) As far as I know

The electron is a point, so it's the smallest.

Quantum field theory explains that all possibilities are expanding and evolving at the same time.

That's why I liken it to coral

If we apply E8, it's the shape associated with each point in spacetime.

As it moves along a curved surface, the twisting direction of its shape determines which elementary particle it is.

In quantum field theory, they're represented as points, and they interact as such.

I can't make it any clearer

(Laughter) (Chris) It's okay.

I have a feeling that I want to know, I definitely want to understand more

thank you it was fun

(applause)

Since our emergence more than 200,000 years ago, humans have created homes and communities all over this planet.

It wasn't created by humans alone.

Just as Homo sapiens are everywhere on this planet, there are other species that are ubiquitous: Canis lupus familiaris.

They can be herded, hunted, pulled sleighs and hunted, and their versatility is astounding.

But the interesting thing about man's best friend story is that all of these creatures actually evolved from one of man's oldest rivals, which is Canis lupus, also known as the Timber wolf.

In the Paleolithic era, when humans first inhabited Eurasia about 100,000 years ago, wolves were at the top of the food chain and rivals to humans.

With a bite force of over 130 kg, it can easily crush bones, and can even pick up the scent of prey from a kilometer away.

Like humans, who hunt, wolves formed social groups of two or three nuclear families to live and hunt.

They use their collective skills to operate as highly capable and tenacious hunter packs, not running faster than their prey, and chasing them to exhaustion.

But the arrival of a similarly powerful nuisance put the wolves at a crossroads.

For many herds, the emergence of these bipedal animals poses a serious threat.

But for other wolves, especially those who don't join packs, human villages presented new opportunities.

Wolves, who showed no hostility toward humans, were able to approach human camps and eat leftover food.

Gentle scavengers outlived their more aggressive brethren, so their traits were inherited, and they eventually began breeding near human camps.

Over time, humans found many uses for the docile wolf.

They tracked prey to aid in the hunt, served as guard dogs in human villages, and signaled the approach of enemies.

The social structures of wolves and humans were similar, so they adapted quickly to human society and understood human commands very well.

Eventually, wolves moved from being on the fringes of human society to making their way into the home, becoming man's first domesticated animal.

Primordial dogs, wolf dogs, appeared around 33,000 years ago, although they look similar to wolves.

It had a short snout, slightly smaller than that of a wolf, and a row of tiny teeth.

But as human cultures and occupations diversified and specialized, so did they.

The squat dog worked as a herding dog to steer livestock, the slender dog chased badgers and foxes from their dens, the slender ones were race dogs, and the big, strong-looking guard dogs.

In the Victorian era of England, the Kennel Club was formed, dog shows began, and these types of dogs began to be standardized as breeds, and many breeds were created just for looks.

All dog breeds, sadly, are the result of human selection, although some have become healthier.

Many of our aesthetic traits are associated with congenital health conditions, such as difficulty breathing or being prone to spinal problems.

Long periods of controlled evolution have had side effects as well.

Artificial selection for manageability has evolved over generations to emphasize youthfulness and docility, much to the delight of humans.

The inherited phenomenon of youthful appearance is called neoteny, and it's found in many livestock.

Humans and dogs, having evolved together for thousands of years, may be a good match.

Not only do dogs understand human emotions and body language, but when dogs and humans interact, both bodies release oxytocin, a hormone associated with affection and protection.

It may be hard to imagine that Pomeranians, Chihuahuas, and Poodles are descended from ferocious wolves.

This diversity of breeds is the result of their relationship with humans, which preceded the birth of cities and agriculture, and even the extinction of Neanderthals.

It's encouraging to hear that over time, even a formidable rival can become your best friend.

In 132 AD, the Chinese polymath Zhang Heng presented his latest invention to the Han dynasty.

Zhang Heng said that this large urn would inform him whenever an earthquake occurred in his territory, including the direction in which to send help.

The courtiers found it suspicious, especially when the vase moved on a seemingly calm afternoon.

But their suspicions turned to gratitude when a messenger arrived a few days later asking for help.

Today, we don't use pots to identify earthquakes, but earthquake prediction is still very difficult.

Why is earthquake prediction so difficult? Also, is there a way to improve the accuracy of prediction?

To answer that, we need to know how earthquakes occur.

The Earth's crust is made up of huge, rugged slabs of rock called plates, resting on hot, partially molten layers that form part of the mantle.

This causes the plate to spread very slowly, at a rate of 1-20 centimeters per year.

But this small movement is so powerful that it creates deep cracks in the plates that come into contact.

And in areas of instability, this intense pressure can eventually trigger an earthquake.

Monitoring this subtle movement is extremely difficult, and there are many different factors that cause earthquakes.

There are different rocks juxtaposed along different fault planes, some rocks that are strong against pressure, some rocks that are weak.

Different rocks react differently to friction and heat.

Some rocks partially melt, releasing a lubricating fluid of superheated minerals that reduces friction on fault planes.

But rock that remains dry tends to build up pressure and become dangerous.

All faults are subject to different gravitational forces and hot rock flows moving through the mantle.

So which of these hidden factors can we analyze and how can we incorporate them into our improved predictors?

Some of these forces occur at roughly a constant rate, so plate motion is also somewhat periodic.

Today, many of the most reliable clues come from long-term predictions that relate to the time and place of past earthquakes.

On millennial time scales, it allows us to predict that very active faults, like the San Andreas fault, are ripe for major earthquakes.

However, due to a variety of factors, this method is only predictive in a rough time frame.

To predict impending earthquakes, researchers studied the earth's vibrations that precede an earthquake.

Geologists have long used seismometers to detect and map these subtle crustal vibrations.

Now most smartphones can record P waves.

Using a network of smartphones around the world, crowdsourced, scientists may be able to build a highly informative and detailed warning system for impending earthquakes.

Unfortunately, smartphones may not be able to provide the up-front information necessary to define safety protocols.

Detailed measurements may be useful in predictive tools, such as NASA's earthquake simulators, which use a precise combination of geological data to identify areas at risk.

But recent studies say these sensors fail to detect the most obvious signs of earthquakes.

In 2011, just before the Great East Japan Earthquake struck, a nearby researcher recorded high concentrations of the radioactive isotope pair radon and thoron.

Just before an earthquake occurs, the accumulation of strain in the crust causes gas to escape to the surface through minute cracks.

These scientists believe that establishing a vast network of radon and thoron detectors in earthquake-prone regions could be a promising warning system that could predict earthquakes a week in advance.

Of course, even with all these technologies, simply looking deep into the Earth's interior won't help.

With greater insight, we could track and predict large-scale geological changes in real time, potentially saving tens of thousands of lives each year.

But for the time being, these technologies are helping us prepare for and respond quickly to earthquakes, rather than waiting for jars to tell us the direction of an earthquake in the area of ​​need.

I'm MoMA's curator of architecture and design.

Today, I want to talk to you about design. Really good designers are like sponges, they're curious and they absorb any information and turn it into something we can use.

It's my job to display that. The themes of the design exhibitions I organize are always completely different.

Today I would like to introduce you to the upcoming Design and Flexibility Exhibition. I would like to introduce you to the upcoming Design and Flexibility Exhibition.

This exhibition deals with the world of science and the world of technology.

Technology and design are closely related, but science and design are less so.

But designers take technological and scientific innovations and make them usable by us.

That is the theme of this exhibition

We use different scales in our lives, different rhythms and different speeds.

Working hours are different Talking to different people I do various things at the same time without being particularly conscious of it

Some of you are very flexible, some of you are very flexible, and some of you are very resistant to change.

Let's talk about inflexible people

my dad in italy won't use the internet

You don't seem to want to run a wire into your house.

Are you worried about something - you may be a little reluctant

Designers are trying to eliminate this feeling of insecurity and discomfort that we have, so that it can help us in our lives.

We need flexibility, we need to nurture flexible thinking.

In this exhibition, I'm going to show you some works that can help you think more flexibly, some of which are about flexibility, not just designers, but scientists as well.

Before I show you a preview of the exhibition, I want to talk to you about the wonderful relationship between scientists and design.

It's origins go back centuries, and the most famous example is Leonardo da Vinci, and it has a very deep history.

Do you know the historian of science, Peter Garrison, a professor at Harvard University? According to him, nanotechnology and quantum physics have captured the interest and passion of designers in recent years.

A designer who builds things from scratch and a scientist who thinks things from atoms are essentially similar.

Today, scientists and designers are rapidly getting closer and collaborating.

MoMA is committed to this new relationship between design and science. For example, we've launched a program with Adam Brye, founder of Seed magazine, a monthly gathering for designers and scientists to interact.

Many stakeholders are participating

At first, it was just a misunderstanding. Scientists tell designers, "I don't know about style."

Even the designers were kind of like, "The math is a little..." We had a hard time understanding each other, but at some point we had a lively discussion, and now we're working together on a project.

Physicist Paul Steinhardt, architects Aranda and Rush, and they jointly exhibited in London.

We are looking at these collaborations

This exhibition presents the work of both the designer and the scientist, and I want to show you the possibilities of the future.

So here are the slides.

Nanophysics and nanotechnology have expanded the imagination of designers.

Focusing on works by designers inspired by science

Many of the works in this exhibition represent concepts rather than things that already exist, and this is the work of a UCLA scientist.

There's a similar form of pasta, but this one's a protein, represented by colors and letters of the alphabet.

It's an attempt to represent all kinds of shapes in the nano world. It's the work of a student at the Royal College of Art (RCA).

It's a new sensory organ, tiny hairs on the nail that grab onto other people's cell shards.

to learn more about each other

They try to find their ideal mate by heightening all of their senses, including touch and smell.

Israeli type designer invented "Typosperma"

This creature he designed is a sperm with a typeface built into it. I'm not sure what you'd call it in English, but it's a creature with many possibilities. For example, every ejaculation might produce a beautiful poem.

organizational design

Again, science and design come together.

The author is a student in the same course as the RCA student I mentioned earlier.

RCA is amazing

One year there was a challenge about cultured meat.

Attempts to artificially cultivate meat

done in australia

The problem with cultured meat is that it doesn't look appetizing.

The challenge given to the students is what the steak of the future should look like.

Meat made without killing cows has no fixed shape. What is the ideal shape?

A student named James King traveled around the English countryside, where he picked the best cows and had them MRI'd.

Based on that image, I created a meat shape. The piece is made of resin, but how could the steak of the future be improved in this way?

Here's a more familiar example

We're using a technology that you know, and it's a wedding ring made from cultured bone tissue.

It's actually made out of human bone tissue.

It's the work of researchers at Symbiotica, who first made cultured meat, then they made cultured leather coats.

It's very small, but it's shaped like a real coat.

In the future, if it's practical, we'll be able to use leather without any qualms.

One of the biggest themes of this exhibition applies to life as well, the different ways we look at things.

A particularly important point is the scale by which we see things, and we change the scale on a daily basis, like we change the resolution of our screens.

In this exhibition, there are works that deal with nanotechnology, but there are also works that map and tag the world and the universe.

Next is information design Next is information design

It's Ben Fry's "Humans vs. Chimpanzees." It's the subtle genetic differences between humans and chimpanzees.

It is an image work

Here's the Pac-Man source code, which beautifully depicts the flow of the program.

This scientist's work charts the similarities of different proteins.

Scientists are starting to think about beauty too.

I was talking to Keith Schwab this morning about trends in scientists, and he said that the reason why scientists' presentations don't look good is because they don't want to look like they're just looking and they don't have substance.

That's why I choose bad backgrounds and fonts.

But recently, things have changed, and I'm starting to combine design and science to create "pretty" presentations.

There's another new trend in the design world right now, and it's collective design that has a lot of promise.

The notebook computers "XO" of the project "A computer for every child" can gather and communicate with each other.

The more computers there are

Communication is stable. Children can use this computer to work together on problems.

The idea of ​​collective design is going to become even more important in the future, and that's one example.

I would like to introduce one more thing related to collective design and the balance between the individual and the collective: the maximum existence.

It's a term I coined a few years ago. We're all feeling a lot of pressure in our collectives, and even then, we've got a little tool, like an iPod, to listen to music and create our own space.

Even if you're on the subway, you can be alone with your iPod.

This is a designer's work, representing the evolution of closed spaces.

Now it's hard to find a place where you can have a slow conversation, so you go to a spa, get a massage, and then you go into this pool, where you can float in water that's just the right temperature and you can focus on the conversation.

It's called "Social Telepresence."

This mechanism is already being used in the military, a technology that allows you to feel like you're really there in a remote place.

This is an example of a blind date. If you don't have the courage to go to a date, you can experience it on the spot.

Another example of how technology and design work together is rapid manufacturing, which I predict could be world-changing.

It is a technology to create products directly from computer designed data.

It used to be called something like rapid prototyping.

It was developed in the 1980s, but at the beginning, it was a prototype made of foamed plastic or something, and the prototype was too fragile to be used in the real world.

Gradually better materials came to be used

Processing techniques have also improved, such as using lasers to solidify powders and liquid resins, and then stacking them to form three-dimensional objects.

Right now, it takes seven days to make a chair, but eventually it will be seven hours.

In the future, we may be able to create our own chairs from our comfort zone.

We send the data to our neighborhood stores to make the chairs. And that means a lot. The buyer is in control of the design, of course, but we don't have to manage distribution.

On the other hand, many manufacturers will also need to upgrade their stores, which is a big change that will change their business model.

This is a picture from Wired magazine in the "Products of the Future" section, showing a basketball made on a 3D printer at home.

Some of the things that 3D printers can already make are fabrics like this.

On the other hand, this is slow prototyping.

A vase made by a designer with 10,000 bees.

I put a bee inside a mold that had this shape.

Mapping and tagging

Computers have become huge, but brains have limited capacity, so we started tagging things so that they would be easier to find later.

Also useful when sharing with others

Sharing experiences is now the focus

A lot of designers these days are also doing work around mapping and tagging.

Sensory designers and scientists are also addressing the potential of human senses.

It also deals with animal senses

This unique shape is based on scientific experiments. Bees have a very keen sense of smell. Dogs can smell certain types of skin cancer. Bees that have been trained to have conditioned reflexes can also detect cancer and pregnancy.

Designed and blown glass by an RCA student, when a bee perceives a particular odor, it enters another compartment, and in this example, it can tell you if you're pregnant or not.

The object for sensing cancer is a different shape.

There's an interesting movement called "design for discussion," which designers started for themselves.

Some designers don't design things. Some designers don't design things. They design predictions based on things.

This is also an important activity.

Because it helps designers think about the future.

usually accompanied by a video

It's Dan and Ravy's "All Robots."

They are all robots that need help.

Ordinary robots help humans, but this robot is very demanding.

Some don't move unless you hold them for five minutes and look them in the eye.

Some are afraid of humans and must be appeased

It makes me think about what a robot is.

It's "The Healing of the Lonely Man" by Noam Tran. It's supposed to be a man who's been separated from a loved one.

I thought of a small item that would be useful in such a case.

This is what steals your sheets when you're sleeping.

The one that blows on your neck

Some throw plates

It is an attempt to give shape to things that make you feel nostalgic in your life.

Elio Kakabare's project started with a doll that teaches about leukemia.

He uses puppets to represent things like organ transplants from animals to humans.

We also have a doll that teaches a child about the techniques of artificial insemination today.

Because it can no longer be explained by flowers and bees. Two mothers and three fathers is possible with IVF, because the circumstances around the birth of life have changed.

I'm making something that helps you understand.

Design is based on life, but some things require skill.

A lot of designers these days are tackling death and mourning with new technologies --

thinking about what we can do

Here are three hard drives, wirelessly connected, beautifully engraved, that hold the entire file of a deceased person.

You can't just look at the picture and mourn, but put it next to your computer, and all the files will appear, and you'll be able to get a feel for what that person was doing back then.

"Afterlife" by Auger and Loiseau

Some people don't believe in life after death

So I thought I'd make something of what's left behind after death, and this is to concentrate the stomach acid of the deceased and turn it into a real battery, maybe even a flashlight, or maybe even a vibrator.

It's inspiring to see people laugh -- and tears -- when they see my work.

Through this exhibition, I hope that you will feel the future of design, and I am sure that it will also reflect the world a few years from now.

thank you

The decline in pollinator insects is a serious problem of our time.

Of the 200,000 species of these insects, the bee is the most studied, partly because of the long history of our relationship with the bee, which stretches back 8,000 years, and which can be seen in cave paintings from that time in what is now Spain.

And yet, these bees, our indicator species, are dying in large numbers.

Last year alone, 40 percent of all honeycombs in the United States were lost.

In regions with extreme winters, the numbers are even higher, like here in Massachusetts, where 47 percent of the nests were lost in just one year.

If this is a human story, and half the population died last year,

What if all the people who died were food producers?

It must be a crisis for mankind

My prediction is that bees will be extinct in 10 years.

If beekeepers weren't doing their job to replace lost hives, humans would be missing essential food: fruits and vegetables, crunchy almonds and nuts, sweet and sour apples, sour lemons.

Hay and alfalfa to feed the cattle became scarce, and global famine and depression erupted, plunging the world into chaos.

So I first started keeping bees here on Cape Cod, right after completing my PhD in bee immunology.

(Laughter) (Applause) To get a degree in that field in a boom like that -- it was 2009, during the Great Recession.

but i was about to grab something

I knew I would always find a way to improve the health of bees.

And here in the Cape Cod community here in Provincetown, the citizen science atmosphere was ripe, and people were looking for ways to get involved and support research.

So we decided to meet in a cafe.

A lovely lady named Natalie from Truro has eight beehives in her home, and she introduced her friend Valerie to set up 60 hives on a former tennis court on her private property.

So we started experimenting with vaccines for bees.

I started researching probiotics.

We called it "bee yogurt" and looked for ways to improve the health of our bees.

And so a citizen scientific research project began.

In my apartment, on the other hand, I was a little concerned about the landlord.

I thought I should tell you what we're doing

(Laughter) I was terrified that I might get an eviction notice, which I definitely don't want.

But the timing seemed right, and when I told him what we were doing and how I started a non-profit urban beekeeping experiment, he said, "Great! Let's put a hive in the back alley."

surprised

I was really surprised

Because instead of an eviction notice, I got an observation point.

You can't see the hives hidden in the back alleys in this image, but in the first year of the study, these hives produced more honey than any other hive that we manage.

It changed the focus of my research.

From the research question "How do you save dying bees?"

Changed to "Where do you live best?"

So we decided to look at all the locations of these citizen science hives in an effort to create a map, and we collected data from people who had hives on their terraces, in their gardens, on their company roofs.

We enlisted the help of the general public, and the more observation points we added, the more accurate our maps became.

You may be wondering, "How can I participate?"

I'm going to tell you about my friend Fred, who is a private real estate developer.

i was thinking the same

I was at a conference thinking about how we could do things at scale to improve tenant satisfaction and help the environment.

And while I was taking a break, I was pouring honey into my tea, and I noticed a message written on the jar about the environmental conservation efforts of the company hosting the conference.

That sparked an idea

When Fred returns to his company

Send an email, then talk on the phone and — boom! Our activities have become national scale

They installed dozens of birdhouses on the roofs of Fred's company's skyscrapers and expanded their operations to nine cities across the country.

Nine years later -- (Applause) Nine years later, we've raised over a million dollars in bee research.

The number of hives used as observation points has reached 1,000 in 18 states in the United States, and the number is still increasing. It has created 65 income-generating jobs for local beekeepers, operates and manages hives in the community, and connects with the local general public to increase the number of observation points.

Now, in order to explain the environmental factors that favor honeybee growth, we first need to understand what causes bees to die.

The top three killers are agricultural chemicals such as pesticides, herbicides and fungicides, various bee diseases and habitat loss.

So we looked at maps and identified areas where bees thrive.

Most were urban areas

If you look at the data, urban hives produce more honey than rural or suburban hives.

Hives live longer in urban areas than in rural or suburban areas, and urban bees are more biodiverse, with more species.

("What do you mean?" gesture) It's interesting, isn't it?

Why?

that was our question

We started by looking at the top three causes of bee death, and we came up with the idea of ​​flipping it around.

First, it's an insecticide.

In collaboration with Harvard School of Public Health

provided our data

Collect samples from citizen science hives on the roofs of homes and businesses.

Checked pesticide levels

I would have expected that in areas where bees thrive, there would be less pesticides.

actually it was different

And here's what I found: the orange bar is Boston, and I expected the bar to have the lowest -- the lowest pesticide levels.

Pesticide levels in urban areas are actually the highest.

The hypothesis that bees depend on pesticides—"less pesticide use in cities"—was wrong.

In my life as a scientist, this often happens.

Whenever I come up with a hypothesis, I find that not only is the hypothesis unproven, but the opposite is true.

(Laughter) Still an interesting discovery, isn't it?

we continued to investigate

Next is a hypothesis about disease.

We looked at disease outbreaks in all the hives.

And what we've found in a study similar to this one in North Carolina is that there's no difference in bee disease, it's the same in urban, suburban and rural areas.

Disease spreads everywhere, bees get sick and die.

In fact, more diseases were found in urban areas.

This is Raleigh, the capital of North Carolina.

Again my hypothesis was unproven and the opposite was true.

research continues

(Laughter) Habitat hypotheses.

An area where bees thrive should have better habitat -- more flowers.

But how did you verify this?

I attended a very interesting conference

The idea came from my friend and colleague Anne Madden, who has appeared at TED.

It's the one that looks at your ancestry with DNA that you might be able to use genomics.

Have you tried it?

You can spit into a test tube and say, "I'm German!"

(Laughter) We did this with honey.

If you take a sample of honey and look at all of the plant's DNA, you can say, "This honey is sumac!"

(Laughter) I also found out about the honey here in Provincetown.

I'm here to tell you for the first time what type of honey is in our city?

Genetic testing of honey DNA

Privet honey is harvested in the spring in Provincetown.

Privets are often used for hedges.

So what should we do?

To save the bees, don't trim the hedge.

(Laughter) I know you're going to argue with me when I say this, but before you throw the tomatoes at me, let's move on to summer honey.

If you're eating Provincetown summer honey, you're drinking water lily nectar, and fall is sumac honey.

I'm finally starting to understand the local ingredients

Now when you're planning a city, you can say, "What kind of plants do you want?"

"What should I plant in my garden for bees?"

Now every region has an answer

What's even more interesting is that when you load the data,

If you're from the Caribbean and want to know about your ancestral food heritage, Bahamian honey tastes like cinnamon and avocado from the Lauraceae family.

Even more interestingly, one teaspoon of honey contains 85 different plant species.

That's the metric we want, big data.

Indian honey is oak tree

All samples from India contain oak, but one Indian honey contains 172 different flavors.

Provincetown honey comes from 116 different spring honeys and over 200 different botanicals for summer honey.

Here are the numbers we need to test our hypothesis about habitat.

And another citizen science approach can tell us more about your food and give us interesting data.

Currently under analysis, in rural areas, we find an average of 150 plant species in a single honey sample.

That's the benchmark for rural areas.

What about suburbs?

Are there many or few plants? The lawns you see in the suburbs are great for humans, but terrible for pollinators.

The plant diversity in the suburbs is very low, and it's nice to have beautiful lawns -- but more can be done.

Turning part of your lawn into flowering wildflowers can diversify your habitat and promote bee health.

anyone can do this

Cities are the best habitats for insects, and there are over 200 species of plants right here.

Here, for the first time, we have data to support our hypothesis about habitat.

Now you know what activities to do in the city.

Insect habitat in the city of Boston is eight times better than in neighboring suburbs.

We can scale this up by working with the government.

Should my epitaph be: "Noah, plant a flower here to rest forever"?

Activities continue endlessly until the end

We can all work together and reach out to governments and city planners. Boston, for example, is mostly linden honey.

Bringing this information to the government would be a great undertaking.

This is the rooftop of Fred's company.

Growing plants on rooftops around the world is the first step toward restoring habitats and protecting food systems.

We worked with the World Bank and the delegation of the President of Haiti.

We worked with some of the brightest graduate students at Yale University and with Ethiopia.

Identifying the source plants of honey in African countries can add value and provide information about what plants to plant to restore habitats and conserve food systems.

But more importantly, it has to do with natural disasters.

Now, we can come up with a numerical index for any habitat in any region, so we can look into it before it's destroyed by a disaster.

how is your hometown

What are the natural environmental risks?

Here's How Puerto Rico Helps After Hurricane Maria

Honey indicators have been researched, pre-hurricane and post-hurricane honey DNA.

I started my research from Humacao

This is where Hurricane Maria landed

What plants to repot, how many and where to replant - you can triangulate from the honey DNA data.

What about Provincetown? Citizen science began in this beautiful place that connected us and was the starting point for our work, where erosion and winter storms are increasing year by year.

What should I do? our precious land

If you look at the DNA of honey, you can find out which plants are suitable for pollinating insects and which have deep roots that protect the soil. Anyone can participate.

The solution is in a teaspoon of honey

Even if your hometown is wiped out and destroyed by a natural disaster, you have the timeless blueprint of honey DNA to restore your natural environment, or perhaps even recreate it by building a greenhouse on Mars.

It may sound crazy, but think about it: a new province, a new home, a place that feels nostalgic, suitable for pollinating insects, and a stable food system -- if you think about the future, it should be.

So now we know what saves bees: planting a variety of plants.

I also learned how bees can help us. They are indicators of environmental health, blueprints, sources of information, little timeless data factories.

thank you

(applause)

you all know

In the summer of 1950, Enrico Fermi, an Italian physicist and nuclear reactor builder, joined his colleagues for lunch at the Los Alamos Laboratory and asked them a question: "Where are you all?"

My colleague was puzzled because they were all together.

Fermi explained that

By "everyone" you mean aliens

A few years ago, something that looked like a saucer had just crashed in Roswell, New Mexico.

After all, it wasn't an incident -- even if it wasn't really nothing -- (Laughter) -- even if it was a weather balloon that crashed and was piloted by a tiny, hairless creature with a small mouth...

America's saucer fever caught even the most eminent scientists at lunch.

Broadly speaking, Fermi reasoned that the universe is so vast that intelligent life must exist -- it's only natural, and --

The universe is so incredibly old that, assuming our civilization isn't the first in the universe, we should already have evidence of intelligent life.

But for now we're all alone

Fermi asked, "Where is everyone?"

Then Fermi used this reasoning to bluntly deny the possibility of fairies, Sasquatch, God, love, etc. After that, Enrico Fermi dined alone.

(Laughter) Now, I'm not a scientist myself.

I've never built a nuclear reactor

But technically everything that can be assembled is made of atoms.

(Laughter) But let me point out two possibilities, which Fermi probably didn't consider.

First, aliens may be very far away.

It's conceivable that you're on another planet

Another possibility is -- (Laughter) -- that Enrico Fermi himself was an alien.

(Laughter) Think about it.

In the midst of a world war, an Italian scientist appears out of nowhere with an amazing piece of technology that changes everything in the world and brings eternal darkness to human history.

And it's funny that he doesn't ask for that reward.

The only thing I wanted--two blue whales

It's- well, it's a lie

but it's weird

(Laughter) And if Fermi is an alien, are you going to try to convince your fellow scientists that the aliens haven't arrived yet?

It's a fact held by some in the Ufology and Ufology community that aliens have been on Earth for thousands of years, infiltrating in disguise, observing us, guiding our evolution from apes to humans -- if evolution is to be believed -- and occasionally abducting humans in saucers and having sex in pyramids.

(laughs) It's hard to say no, right?

(Laughter) I have some inexplicable memories of my own life -- events so bizarre that I can't help but think they were the result of frequent, long-term contact with aliens throughout my life.

How else can I explain, I'm going to tell you the amazing true story of a close encounter I had.

Close Encounter 1 1980 Ocean City, New Jersey

This summer, "Encounters with the Unknown Special Edition" was released.

I was on vacation with my parents on the Jersey Shore

Twelve hours after I got there, I got a bad sunburn, just like Richard Dreyfuss.

(Laughter) So the rest of my vacation was spent mostly at night outside my rental house on the sidewalk in the warmth of the sun, looking for UFOs and looking up at the sky.

All I could see were stars, satellites, flickering planes - just plain junk in the sky.

Sometimes the children would come and look at the sky with me, but soon my neck would hurt and I would go to the promenade to play games and play with people.

I'm good at games, but I'm not good at humans, so I was looking at the universe by myself.

The incident happened then

An elderly couple walked down the street

I think he was in his late 70s, and he was probably on a date.

The woman is wearing a cardigan. It's late at night, and the cold air is coming from the sea.

For some reason I remember that the two of us were the same height

They stopped and the man said to me, "What are you looking for - a flying saucer?"

(Laughter) That's too accurate a guess for an elderly person on a date, isn't it?

What's even stranger, even as I was nine years old at the time, was that they stopped.

This old man deliberately interrupted his walk with her to tease the child.

He said, "Oh, the little green one."

girlfriend also said

"Aliens don't exist"

"That thing doesn't exist"

And they laughed, "ha ha ha"

i looked around

no people on the street

I didn't hear the sea

time seemed to stop

Why they teased me is a mystery

The strangely angry look on their faces made me think, Are they wearing rubber masks?

(Laughter) So what's under there?

Big, almond-shaped, lidless eyes?

Do you have a small mouth?

He bent his fingers like a man shooting a gun, mimicking a laser beam.

"Squeak squeak squeak - watch out"

and they both left

The man stretched out his gnarled hand to her, hand in hand and left me alone.

Now, you can dismiss this scene as a simple misunderstanding - a human-to-human encounter.

You're misreading the swamp gas, but -- (Laughter) -- I'm pretty sure I saw it.

Close Encounter 2 1984 Brookline, Massachusetts

I went to the movie "Dune," and a girl talked to me. Obviously -- (Laughter) -- it's obviously impossible, but it's true.

Of course it was the opening day.

I was with my friend Tim McGonigal.

Tim on the left, the girl in question on the right

Long curly black hair wearing a denim jacket

I remember she had an injured ankle and she had a bandage and crutches.

I think you were very tall

At the time, I was a freshman in high school, and she looked like a sophomore.

I don't know your name, I don't even ask

She was talking with someone who looked like her mother about the novel "Dune."

Both mother and daughter are avid fans - very strange

We were talking about my favorite character being a giant sandworm.

Even more strange things happen here

All of a sudden, she turns to me and says, "Are you looking forward to seeing this movie?"

(Laughter) I was confused.

At the time, I was just a movie buff, specializing in films about desert planets.

(Laughter) And her tone was abrupt, like she didn't care what she said, she just wanted to talk to me.

I didn't know what to say so I said "yes"

without changing the direction of your face

the movie has started

Of course, the movie was David Lynch's version, and all the characters were sexy and deformed.

(Laughter) The guild's navigator character is a gigantic, floating fetal creature that lives inside a giant tank full of swirling orange hazes of hallucinogenic spice that bends time and space with the power of spice.

The navigator cannot leave the tank and has no contact with the outside world.

While living in solitude, I transform and become too sexy, I can only talk to the outside through a machine like an old radio, I can't touch it

I liked it much more than sandworms

Sandworms are good too, but when asked if they like it best

I want you to do it

When the movie ended, everyone seemed to be itching, and they wanted to get out of the theater quickly.

But the girl in question was different

She slowed down when I left

Maybe it was because of her crutches, but she -- (Laughter) -- seemed to want to talk to me again.

It may sound strange to say this, but the conclusion I've come to is that this event is what people who were abducted by aliens call "hidden memories." These are silly, false memories that your brain creates to cover up, for example, the trauma of being abducted and blasted down the sex pyramid.

(Laughter) So I'm glad I slowed down and didn't talk to her.

I'm glad I never met her again

Close Encounter 3 Philadelphia, Pennsylvania 1989

In the late 1980s, writer Strieber published "Communion," a book in which he described his many years of being abducted by aliens.

He also writes about a phenomenon that people who have had the same experience call "Lost Time." Strieber suddenly finds himself unable to remember what happened in the last 10 minutes, 10 hours, 10 years.

His idea is that this time the aliens took him away and gave him a rectal exam.

(Laughter) The book became a huge bestseller.

This painting by Ted Joseph is in this book, and it's a kind of police caricature of what Strieber describes as a creature.

"Communion" became a big hit and made into a movie

I remember being in Philadelphia in 1989 to see my girlfriend, and we just happened to go see this movie.

In my memory, the highlight of this movie is

1 Christopher Walken as Whitley Strieber

2 Aliens are rubber dolls

(Laughter) 3. The scene where the rubber doll gives Walken a rectal exam for a surprisingly long time.

4 This movie was shown in a very ordinary theater in the center of Philadelphia.

5 So what I'm saying is that Christopher Walken starred in the movie based on "Communion"

Something is wrong, don't you think?

Anything strange? Is something wrong? Is there something wrong with this movie?

Think about it. The answer is - I had a girlfriend. What?

(Laughter) How did it happen? When did it happen?

I remember walking out of the theater, holding hands, and suddenly this fact struck me, and I kept thinking about this question.

To this day I haven't found an answer

Close Encounter 4 Portugal Algarve 1991

A few years later, me and this woman, let's call her Catherine Fletcher (Laughter), traveled to the south of Portugal.

We stayed in a small hotel in an old crumbling walled city, climbed onto the roof, drank vinho verde, watched the sunset and played checkers.

what? did you do this? Really? would anyone do this?

we went to topless beach

Really? no i never went

I don't know if it's true or not, but I went to Sagres, what was then the end of the world.

There I was chased by a pack of stray dogs, my boss bit me on the buttocks, and I ended up in a strange Portuguese hospital who gave me injections in my buttocks.

you are free to interpret

(Laughter) On our last day in Portugal, we were in Faro, the provincial capital, and Catherine said she wanted to go to the beach one last time.

Faro is a busy little city, and she says you have to take a bus and a boat to get to the beach.

I was asked if I would go with you

I said I wasn't going because I was exhausted and bitten by a dog.

I remember what she looked like before she left

I had blemishes on my face and shoulders that grew and grew and looked like sunburns.

Sunburn, both of us - is this true?

her eyes were so bright and blue because of it

she was laughing

I was an unmarried woman, and I didn't even know the language, but I was on my way to an unfamiliar beach by changing buses and boats.

I love her and she's gone to strange and strange lands

It took me a while to come to my senses

I also experienced "Lost Time," and before I knew it, it was very late and it was almost time for dinner, and she hadn't gone home.

I got worried and went out into the street looking for her.

i don't speak portuguese

I don't even know where the beach is

We can't even reach them by cell phone, in 1991 the aliens still haven't given us that technology.

(Laughter) I realized that there were only two possibilities: either Katherine returned to the hotel, or she never returned.

So I decided to sit and wait

Not in the sky, but across the street, watching buses and cars, pedestrians and scooters pass by.

I expected her face to peek through the crowd as I watched the crowd pass by.

In that moment, in a small town of maybe 30,000 people, I learned that the universe is vast and what it's like to look for something there.

A group of Liberians came

Five young men, all laughing and having a good time, and just returned to the hotel.

One of them, named Joseph, asked me what I was doing, so I explained.

"Don't worry," he said.

But he didn't seem very confident, so he sat with me and waited.

For the next two hours, everyone waited with us, taking turns walking up and down the room, distracting us with jokes.

The message they conveyed in the last two hours

that we are not alone

And as the sun went down, I turned around and looked down the street, saying something.

The stars lined up and she returned

She smiled and didn't understand why I was worried

The Liberians don't know either But the laughter they slapped us on back to our room was filled with relief We were on the street hand in hand

Events like this leave a scar in my memory, like a piece of alien technology that a "Portuguese doctor" inserted into his buttocks.

(Laughter) Even now, 15 years later, when we got married, I still look for her when she's not in the room.

Even if she was kidnapped and replaced with an alien clone when she left, I will still love her and wait for her.

thank you

(applause)

We live in a world dominated by screens, dominated by mobile phones, tablets, televisions and computers.

You can experience anything you want, but you feel nothing.

You can make as many friends as you like, but there's no one to shake hands with.

I'm going to take you to another world, a world of imagination, where we can use our greatest powers to not only change our physical surroundings, but to completely change the way we feel in the future, and change how we think about other people with whom we share this planet.

Co-founded in 2006, Artichoke aims to create precious moments.

There are moments in everyone's life, and no one remembers the daily commute to work on the 38th bus on the day of death, or the daily shopping trips where parking is a problem.

I remember the first steps of my child, the time I was selected to play on the soccer team, the feeling of love.

Artichoke's role is to use the imagination of the artist to transform the physical environment, create a moving moment, and show that this is possible.

we create beauty in ruins

review history

The moments we create are open to all as witnesses and participants.

For me, it all started way back in the 1990s, when I was put in charge of a festival in a small English town called Salisbury.

you've probably heard

This is Salisbury Cathedral, and this is the nearby ruins of the world-famous Stonehenge.

For hundreds of years, the town of Salisbury has been ruled by the Church, the Conservatives and the military.

This is a place where residents respect discipline.

In my first year in such a place, imagine me riding my bicycle on a one-way street late and running backwards.

I am a habitual latecomer

It's a wonder I made it in time today

(Laughter) Then a cute old lady on the sidewalk kindly shouted, "You're going the other way over there!"

I was going to reply politely, "Yes, I understand."

I was yelled at, "Die!"

(Laughter) I realized that people like me would have a tough time here.

And yet, a year later, through persuasion, negotiation, and all the means available, I was able to produce a piece of work.

It's not a classical church concert, it's not a poetry reading, it's a production by a French street performance troupe that performs Faust's story "Mephistomania" on stilts with handheld fireworks.

The day after the show, that sweet old lady stopped me on the side of the road and asked, "Are you in charge of last night's event?"

I stepped back

(laughs) "Yes."

"When I first heard it, I thought it was definitely not my hobby.

But, Helen, I'm glad you did."

what happened

Curiosity overcame suspicion, fun overcame anxiety.

So I started thinking about how I could take this idea to a bigger stage, and began a long road to recreating something similar in London.

Think - London is a cosmopolitan city

Like all cities, urban functions are focused on labor, commerce, and transportation.

It's a device that accurately gets people to work and back home.

But what if we took this wonderful city and turned it into something so unimaginable that it changed people's lives?

In the UK we often do this

I'm sure you'll do it in your country too

this is cavalry change

I also do this a lot, every time it's a victory celebration.

It celebrates marathon winners, war victories, the triumphant return of the winning cricket team.

The roads are closed and everyone applauds

But can it be closed for the stage? That's impossible

What changed that was a production by a French theater company about a little girl and a giant elephant that visits her for four days.

All I had to do was convince public officials that it was perfectly natural to shut down the city for four days for this show.

(Laughter) The traffic was cut off, and only the people, having fun, came out into the streets to marvel at and experience the wonderful artistic endeavors of the French theater company Royal des Luxe.

It took me seven years to get here, and during that time, I said to a group of men occupying the room, which was always mostly men, that I said, "Well, it's like a fairy tale about a little girl and a giant elephant. We're going to be in town for four days, so everyone can come see it and experience it with us."

People ask me, "Why are you doing that?

does it have a purpose?

In commemoration of the president's visit?

A sign of friendship between France and England?

Is it for charity? Is it for fundraising? ”

I answer, "No, not at all."

So you say, "Why are you doing that?"

But four years later, with this kind of magic, something amazing happened.

I've been going to the same meetings for four years straight, and I've been saying, "Please, please."

But that time, instead of asking, I said,

"Regarding the plan we've been telling you about for some time, we'll be implementing it on this schedule, so we need everyone's cooperation."

Then the magic was decided

Each person present decided that someone else had given permission.

(Laughter) (Applause) We decided that we hadn't been held accountable. So bus operators were only asked to divert buses, City Hall officials were only asked to close roads, and Transport for London was asked to run the Underground.

Each of us was asked to do something within our power, and that worked for us.

No one was asked to take responsibility.

"Yeah, I'm responsible," I thought naively, and the result was a million people on the streets.

it was our first performance

(Applause) It was our first show, but it changed the nature of cultural appreciation. Instead of being in a gallery, not a theater, not an opera house, but a live performance in the city, it transformed public space into a stage for the widest possible audience, even those who weren't willing to buy a ticket to see something.

we've come this far

After I finished this piece, I continued to make this kind of work.

As you can see, this company's work is mind-boggling, and what's even more mind-boggling is that it got permission.

There is no appearance of security at all

It's only been nine months since the bombing that ravaged London.

So I started to wonder if I could do something like this in a more complex context.

We're in Northern Ireland, or northern Ireland in some ways -- that's what we focused on.

This map shows England, Scotland and Wales with Ireland on the left.

It's been the scene of conflict for generations, between the predominantly Catholic Southern Republic and the predominantly Protestant Loyalist (Remain) region, a battle that's been going on for hundreds of years.

Now that peace talks are underway, this is what Remainers call Londonderry, and Catholics call it Derry.

But everyone calls it "Furusato"

So I thought, could we do something about the tribalism of this region with art and imagination?

Every summer, people in this area make their own bonfires like this.

It is a mountainous collection of objects of hate, such as dolls and symbols that symbolize the opposing side.

This is a similar bonfire for Remainers.

Burned like this every summer

takes place in the middle of town

So we turned to "Burning Man," which takes place in the Nevada desert.

This is David Best's one-of-a-kind piece, "Temple," built during "Burning Man" and burned last Sunday.

So we invited him and his peers, and recruited participants from both sides of the political and religious divisions -- young people, the unemployed -- people who would normally not interact or talk to each other.

With the incredible power of these people, the "Temple" was built, and its appearance is as good as the two cathedrals that exist in this city, a Protestant cathedral and a Catholic cathedral.

But this temple is for everyone, regardless of religion, not for a particular community, but for everyone.

They said no one would go where they built this.

Because it's between two communities, and it's too dangerous.

I kept saying, "But the view from up here is amazing."

(Laughter) Again, the same question: "Why not do this?"

In this picture, you can see the lead of a group of 426 elementary school students who were led up a hill by their principal, who didn't want the children to miss out on this opportunity.

And then, like the Nevada desert, with varying degrees of temperature, the people of this community, 65,000 people, wrote down their sorrows, their pains, their hopes, their hopes and love for the future.

In the end it's all just about love

They live in a conflict-torn society, with high levels of post-traumatic stress and high suicide rates.

But in this moment, because it would be silly to expect anything more than that. Kevin, for example, is Catholic, and when he was nine years old, his father was shot while sleeping in his upstairs bedroom. Kevin was a volunteer.

He was the first to hug an old Protestant woman who came to the show on the opening day.

"Temple" towered over an empty place and stood still for five days.

And then, out of a limited number of people, I chose the non-affiliated construction crew that I worked with -- people who gave months of their lives to make this incredible building happen -- and I chose someone to start the fire.

This video is that moment, standing together in this dark, cold March night, in this place where 15,000 people gathered and watched closely, putting their hatreds in the past and sharing them. This was an opportunity for everyone to say what they couldn't say.

And together, they watched members of their respective communities let go of this beautiful thing, which was just as difficult as letting go of the thoughts and feelings they'd been holding onto that went into making this piece.

(music) Thank you

(applause)

As the 2016 presidential election approached, many of us, myself included, saw how the atmosphere in the world grew more discordant, harsher, and more repugnant.

Polarization has progressed to an abnormal degree

It was a depressing and tragic event.

Meanwhile, with fellow journalist Jeremy Hay, I started thinking about how I could do my job in a new way.

Getting to the heart of the divide, the arena of conflict, is what journalists do all the time, but it's an approach that goes one step further.

It's the basics of journalism -- the identification of information, the careful research, the curiosity, the desire to contribute to the public welfare, the contribution to democracy, and so on.

Against this backdrop, we have created a new process called "dialogue journalism," which takes us to the midst of social and political divisions and provides opportunities for opposing groups to exchange views on controversial issues with the intervention of journalism.

But in this increasingly divided world, how do we do that? Now, even relatives can't have a decent conversation, the media is divided into right and left wing, each disseminates different information, and people always reflexively slander or ignore those who don't agree.

I still wanted to try

So, shortly after the 2016 presidential election, between the election and the presidential inauguration, we did something new with the help of the Alabama Media Group.

They brought together 25 Trump supporters in Alabama and 25 Clinton supporters in California.

We brought them both together in a private, moderated Facebook group for a month to exchange ideas.

What we wanted was to create a space where participants could interact openly and with curiosity.

We also tried to build relationships, not just with each other, but with us journalists.

And then we also provided the facts and information, the facts and information that the participants could actually absorb, digest, and help move the conversation forward.

To prepare for the dialogue, the first step in dialogue journalism is to ask people to imagine what the other group thinks of them.

When I asked Trump supporters in Alabama how they were perceived by Clinton supporters in California, they said,

"Fanatical Christians"

"Outdated and stupid redneck"

"Every house has a Confederate flag and everyone is an uneducated racist and sexist."

"No shoes, always pregnant, no pavement in front of the house."

"All in one, a picky man, walking around in old-fashioned hoop skirts, cotton fields in the background."

Then we asked the participants in California exactly the same question, "What do you think people in Alabama will think of you?"

And the answer that came back was, "Crazy liberal Californians."

"Non-National"

"Puffy elitist"

"Atheist and sweet to children"

"People who put their careers before their families"

"Elitist, unrealistic intellectuals, wealthy, eating organic food, very unrealistic people."

When people on both sides are made aware of their own stereotypes by asking these questions before engaging in dialogue, and asking them to share their own stereotypes, people on both sides realize that they have a short-sighted, sometimes mean, caricature image.

So from there, we can move on to the process of true dialogue.

Now, two years into the California/Alabama Project, we've hosted many conversations around the country and worked with media across the country.

It covered the most divisive topics: gun control, immigration, race and education.

And what I found, surprisingly, is that it's really possible to have a real dialogue.

Also, if given the chance and the opportunity, many, if not all, citizens would like to have dialogue with people who disagree with them.

For some reason, journalists tend to accelerate divisions under the pretext of storytelling, readership, and opinion assertion.

It also cites both extremes of divided opinion, appealing to readers seeking biased reporting with a compelling anecdotal gist and clear quotes.

But our interactive process is slower paced and has a different focus.

And the principle that guides our work is that dialogue across dissent is essential for democracy to work, and that journalism and its practitioners have many roles to play in supporting it.

So how are we going

We are as transparent as possible about our methods and motivations at each stage of the project.

At each stage, we solicit questions from participants and explain the purpose of carrying out the project.

Tell them that this is not a ruse, that they are not being ridiculed, that they are not disrespecting their experience.

Also, I always ask the participants to change their attitudes, and I ask them to avoid reflexive cursing, which has become so routine that they are not even aware of it, regardless of their ideology.

Immediately after participating, it is easy to see an angry attitude.

People often ask me, "It's incomprehensible to think that it's X."

"It's insane to read Y paper."

"I don't know why this happened," etc.

But the good news is that most of the time, miraculously, everyone starts introducing themselves.

It starts with who you are, your name, your profession, where you're from, and asks each other questions.

And then we take our time to get back to the difficult topic, and each time we build more empathy, more nuancedness, more interest.

Journalists and moderators are doing their best to support this, too, because this isn't a debate, it's not a fight, it's not a Sunday morning talk show.

not a place to argue

It's not the place to cite images or headlines to substantiate your point.

It's also not the place to win political victories by asking trick questions.

What I've learned here is that a state of discord is in no one's favor.

it's a very unfortunate situation

Many participants repeatedly say the same thing

I am grateful for the opportunity to treat others with respect, concern and openness, and I am pleased and relieved to have the opportunity to come to a ceasefire.

This project is designed to directly question the current political climate in our country, and we know that helping people who disagree with each other to exchange ideas can be very difficult, and we've done it.

I also remembered that democracy depends on our ability to solve common problems together.

I've also put community at the heart of the journalism process, putting my ego in check and listening first, listening outside of my own preconceived notions and ways of thinking, and working with others to do the same.

And we're doing this because journalism as an institution is in trouble, and it has a role to play in supporting the exchange of ideas and views, now and in the future.

For many of the group participants, the reaction continued after the end.

A lot of people are friends on Facebook and in real life across political divides.

After the first installment of the Trump/Clinton Project, about two-thirds of women have created Facebook groups, moderated in each state, to continue to exchange ideas on difficult topics.

Participants repeatedly expressed their gratitude for having the opportunity to participate in the project, knowing that those who disagreed were never insane, and being able to connect with people they would never otherwise have known.

A lot of what we've seen and learned isn't all that difficult, despite its name, Spaceship Media.

If you curse, label, or insult people, they won't listen to you.

Sarcasm, humiliation, and looking down on people will not lead to a solution.

True communication requires practice and effort, ego control and self-awareness.

There's no algorithm to make things better

A true connection between people doesn't exist unless people actually connect.

So, show interest in the other person, value discussion, not debate, and break out of your shell.

It's the silver bullet that our democracy desperately needs.

thank you

(applause)

2014 was a milestone year for me.

Have you ever had a big milestone year?

As for my 2014, I miscarried my second pregnancy on October 3rd.

I lost my father to cancer on October 8th.

Then, on November 25th, after a three-year battle with the disease, my husband, Aaron, died of stage 4 glioblastoma, which is, in layman's terms, cancer of the brain.

I'm having fun

(Laughter) People love to take me out all the time.

I'm too busy socializing

When I talk about this milestone in my life, the usual reaction is (sighs), "I can't imagine it."

but i think you can imagine

you should be able to do it too

You should imagine, because one day it will happen to all of you.

I don't think you'll be bereavement in this particular order or speed, but I'm having a lot of fun with it, and I think you'll be shocked by my findings. 100% of the people you love will die.

(Laughter) That's why you came to TED.

(Laughter) (Applause) Now, because of all these bereavement experiences, I've made it my business to talk about death and bereavement, not just my own, easily summarized experiences, but also bereavement and grief that other people have experienced.

You could say it's a niche job

(Laughter) It's pretty niche. I wish I could make more money...

(Laughter) I've written some positive books, hosted an uplifting podcast, and started a small nonprofit.

I want to make things that are difficult for as many people as possible accessible. Grief is a difficult thing to deal with.

It's even more uncomfortable when it's someone else's grief.

Part of that work is a group I started with a friend of mine who is also a widow, Moe, and they call it the Hot Young Widows Club.

(Laughter) It's a real group with membership cards and t-shirts.

And when your husband, wife, girlfriend, boyfriend, or someone else you care about dies, whether you're married or not, your friends and family will follow every acquaintance to find someone who's gone through a similar experience.

(Laughter) That's what we do.

There are small groups of people, men, women, gays, straights, marrieds, de facto couples, etc., who can talk about their own loss and what the people around them aren't ready to hear or don't want to hear.

A wide range of topics are discussed

For example, "Is it normal for my husband to die two weeks ago and to think about sex all the time?"

of course

"Even with a celebrity?"

It's not normal, but it's an ant

(Laughter) He also said, "When you go out and you're clearly two older people who have been together for decades, holding hands, you see them and imagine all the things they've been through together -- the good and the bad, even arguing about who should take out the trash...

I'm boiling with anger! ”

(Laughter) By the way, I agree with this.

A lot of the conversations we have in groups are reserved for the participants, but some of the things we talk about can be very useful to the world outside the group, to the world that's next to grief, but hasn't yet faced it.

As you can see, I was only interested in, and could only do, non-scientific research, so I went to the group and said, "Do you remember when someone important to you died?"

"Do you remember everything that people said to you?"

"I remember you."

"Which word did you hate the most?"

I got a lot of comments and answers, a lot of different opinions, but this word quickly rose to the top.

"Proceed to the next"

Now, since 2014, I've been remarried to a very handsome man named Matthew, and we have four children in our blended family living in the suburbs of Minneapolis, Minnesota, USA.

I have a rescue dog

(Laughter) I'm in a minivan, the kind of car that you can't touch but the doors open wide.

(Laughter) It's a good life by any Kijun.

It's the first time I've pronounced "criterion" like this.

(Laughter) I don't know why I said that.

(Laughter) I've never heard anyone else say that.

I feel like that's the right way to say it, and that's why the English language isn't good...

(Laughter) I admire people who can speak English in addition to another language that makes sense, which is great.

(Laughter) By any standard...

(Laughter) It's been an amazing life, but I haven't moved on yet.

I haven't moved on, and I hate that word so much, and I can see why other people hate it.

Because it suggests that Aaron's life and death and love are but moments that can and should be put behind.

I've always thought I was weird when I used to talk about Aaron in the present tense.

Then I realized that everyone does

It's not because the situation is unacceptable or forgetful, but because the loved ones we lost are still there for us.

So when I say "Aaron is..." in the present tense,

Because Aaron is still in the present.

It's not the way he used to exist -- it's not as good as the religious people say, "He still exists."

His existence cannot be erased, so it exists for me.

He's still in my job, and he's in the children we had together, and in the other three children. I've never met Aaron, and I'm not related to him, but they're in my life because I spent time with Aaron and lost him.

Matthew and I have him in our marriage. Aaron's life, his love and his death made me the woman Matthew wanted to marry.

So I didn't move on from Aaron, I moved on with him.

(Applause) Aaron's ashes were scattered in the river he loved in Minnesota, and when the bag was emptied -- you know, when you're cremated, you put your ashes in a plastic bag -- there was still ashes on my fingers.

I could have rinsed my hands with water, but instead I licked them clean. I was so scared of losing more than I had already lost, and I was desperate to make sure he would always be a part of me.

but of course he is

It's heartbreaking to see someone you care about accept something that's toxic to your body for three years so that you can live with them a little longer.

Seeing him, who was healthy the night we met, recede into nothingness, is memorable.

When you see a son, not yet two years old, on the last day of his father's life, walking to his bed and saying, as if anticipating what's to come hours later, "I love you, goodbye, goodbye."

it's memorable

When you finally fall in love with someone who really understands you and sees you for who you are, and you think, 'Oh my God, I've been wrong all this time.

Love isn't a game, it's not a reality show, it's so gentle Even if everything's chaotic and things fall out of your hands And even if he's gone, love is the invisible thread that binds us together."

it's memorable

My hands were always cold and his was warm, so I put my ice-cold hands in his shirt

pressed against his warm body

(Laughter) He hated it. (Laughter) But he still loved me. After he died, Aaron and I lay in bed and I put my hands under his body and felt his warmth.

I don't know if my hands were cold, but I knew it was the last time I could do that.

This memory will always remain a sad memory

It's always a memory that hurts my heart

Even if I become a 600-year-old hologram.

(Laughter) It's the same way I always laugh at the memory of meeting him.

Sadness isn't an empty space, it happens simultaneously and mixed with other emotions.

I met my now-husband, Matthew, who doesn't like the title.

(Laughter) I met Matthew

I heard a sigh of relief from those who loved me, "This is it!

I did it

Happily ever after with a happy ending

we did well"

And that storyline was very appealing to me, and I wondered if that was the case, but it wasn't.

another chapter has begun

It's a very nice chapter - I love you - a very nice chapter

But it also felt like a parallel world, especially in the beginning, and it was like an '80s story with two parallel plots of "What would you do?"

And when I open up to Matthew, my brain says, "Are you thinking about Aaron? Past, present, future?"

i wanted to think

And all of a sudden, two stories unfolded, and falling in love with Matthew made me truly realize how much I had lost in Aaron's death.

Just as importantly, I've come to realize that my love and sadness for Aaron and my love for Matthew are not opposing forces.

are intertwined with each other

it's the same thing

I... my parents tell me

not special

(Laughter) My parents have four children, and that's all.

(Laughter) I'm not special.

I know all too well that terrible things happen all over the world every day.

at any time

Like I said, I enjoy it

Terrible things do happen, and people go through breakups that change them profoundly and leave scars every day.

As part of my job, I have a podcast where I talk about the worst things that have happened to people.

Sometimes the experience of losing a loved one happened days ago, weeks ago, years ago, decades ago.

The people I interview are neither closed off nor centered in the separation from their loved ones.

They keep living and the world keeps spinning

But the reason they tell me, a complete stranger, about the deceased they loved is because the experience of bereavement can influence and shape us as much as a joyful experience.

just as decisively

Ever since the condolence letters and sympathies stopped coming.

We don't tell people who are experiencing the joys and wonders of life to "move on," right?

You don't send a "congratulations on your new baby" card and five years later say, "Another birthday party? No more."

(Laughter) You know you're five years old, right?

(laughs) How amazing

(Laughter) The grief of bereavement is like love, childbirth, The Wire, and it's something that you don't understand until you experience it.

And once you've experienced it -- falling in love, having a baby, being widowed, and sitting front row at a funeral -- it makes sense.

You realize that what you're going through isn't a momentary thing, it's not a fracture that will heal, it's something that's permanent.

It's something that can't be cured

Even if it's not fatal, the grief of bereavement can seem so.

And what if we can't prevent each other?

What can you do? Other than assuring each other that some things in this world can't be healed and not all wounds can be healed?

We need each other to remember and to remind each other that bereavement is a multifaceted emotion.

You can be sad and happy at the same time, mourn and love at the same time, in the same year, in the same week, in the same moment.

We have to keep in mind that people who are sad will also laugh and smile at some point.

If you're lucky, you might find love again

Of course they will move forward.

It doesn't mean that you forgot your sorrow and moved on.

thank you

(applause)

You might wonder why I wear sunglasses, because I'm talking about "glamour."

I think everyone understands glamor

Glamorous movie stars like Marlene Dietrich

It can also be a man. It's very glamorous.

I don't just have guns and cars and booze, I drink wine, and I wear a tuxedo, of course.

But I think glamor has a much broader meaning than movie stars and fictional characters.

what about magazines

this is different

Even magazines specialize in dirty jokes far from glamor.

Dirty jokes are not glamorous

Drew Barrymore is attractive, but not glamorous.

while the factory is glamor

This photo was taken by Margaret Bourkewhite.

Pictures of factories like steel mills and paper mills are very glamorous.

There's a mythical glamor to those who start a business in a garage.

This is the Hewlett-Packard garage

They think that anyone who starts a business in a garage can start HP.

physics is also grammar

The grand unified theory for understanding the universe is extremely glamorous, and Dr. Brian Greene is glamorous in another way.

It's also glamorous

Outer space is very glamorous, not alien glamor, but clean early '60s glamor.

What does "glamour" mean?

One way to find out what it means is to look it up in a dictionary.

And an old dictionary can help. This one was published in 1913.

The word "glamour" has been used for hundreds of years in a very specific way, in a way that's not what we think it is.

What was the old glamor

It was more of a "play" on the other person than an expression of their nature.

Glamor was a magic spell

It's not metaphorical, it's literally magical, and it's connected to witches, gypsies, and Celtic sorcery.

Then, around the turn of the 20th century, glamor came to have a different definition, which is "an artificial interest or association with an object through which it becomes unrealistically exaggerated or glorified."

Still glamor is a kind of illusion

glamor is a spell

There's a dangerous part here, because witches don't cast spells for the benefit of others, but to make them act against their interests.

And in the 20th century, glamor came to have a meaning associated with Hollywood.

actress Hedy Lamarr said

"If you want to look glamorous, act stupid." (Laughter) But to her credit, that's not all. More on that later.

The art of creating Hollywood glamor has definitely advanced.

We have experts in image retouching, lighting and makeup.

If you go to the Hollywood Museum, you'll see a special room where Max Factor has painted the walls to match the complexion of the stars he wears makeup.

The result is an out-of-this-world, stylish portrait of a star.

I also often see photographs of the stars that have become more glamorous, and this is called a "false color" image.

Glamor is a kind of deception, but deception for effect.

This is what makes stars shine and movies sell.

This requires great skill

No one is glamorous from the moment they wake up in the morning, everyone is.

Even Nicole Kidman isn't glamorous when she wakes up

It requires a process of idealization, beautification, dramatization, and this is only for humans.

not limited to

Architectural photography also spoke of the art of transformation. Julius Shulman has a famous photograph of the Kaufmann House.

architectural photography is very glamorous

I feel like I've entered a special world

Alex Ross's comic art is very realistic.It's his style to draw comic art that feels real.

It's just different from how the actual light hits.

If you put people in rows, the back row will be smaller than the front row, but in the world of glamour, that doesn't matter.

To quote New York Magazine's table of contents on the resurgence of glamor, glamor is truly a transcendence from the mundane.

There are many kinds of glamor, but I think this is a clue to getting closer to the essence.

A portrait of Saint Apollonia by Filippino Lippi

I don't know this woman very well, but I'd say she's a 16th-century supermodel.

A very glamorous portrait

why glamor

First, because this woman is beautiful.

She's graceful, mysterious, and otherworldly, and that's the essence of glamor.

I can't see my eyes, I'm looking down

Not to look away, but to let her imagine her world.

It invites her to ponder the higher, peaceful world she finds herself in. In her hand is the instrument of torture that led to her death.

Mel Gibson's Passion Isn't Glamor

This is glamor. In Michelangelo's Pietà, Mary and Jesus, who are the same age, are happily ecstatic.

Through glamor we live in another world

Glamor is mysterious and a little distant, which is why people don't look at you in glamor photos, and that's why sunglasses are glamor.

need something in common

So if it's a religious painting, God can't be glamorous.

God is omnipotent and omnipotent, far beyond us.

Religious paintings, on the other hand, often depict saints and the Virgin Mary in glamor.

I said earlier that glamor isn't just for humans, but we need a transcendence.

what about superman

Even discounting Alex Ross' glamorous portrayal, there's something about Superman that makes you believe he can fly.

Glamour means transcending the world to reach the ideal, the perfect place.

That's what makes rides so glamorous

The less you have ridden - the more glamorous you look

So you can make a picture of a car glamorous, but you can't make a scene where cars come and go.

Aircraft photos are glamorous, but in-flight photos are different.

The image of carrying people is important, and I don't associate it with a man carrying a noisy child on a plane - or a man with a big cough.

It's about talking and thinking about your destination.

The sense of movement is one of the reasons the form looks so glamorous.

Because the streamlined form is reminiscent of the movies of that era, not because it's glamorous, but because it takes us out of the ordinary.

The arch is also glamorous

It's even more glamorous with stained glass

The staircase that curves in front of you is glamorous

The staircase in this photo, in particular, foreshadows a life full of academic inquiry, and maybe that's why I went to Princeton.

Skyscrapers are so glamorous, streets aren't

If you actually go to this city, reality is waiting

Horizons and open roads are very glamorous.

The horizon is glamorous, and the only thing beyond it is the double horizon.

You don't feel the cold or the heat in this place, you just imagine the possibilities.

To have glamor, you need the Renaissance quality of "sprezzatura," or "calculated carelessness," a term Castiglione used in his book—The Courtier.

Hundreds of years later, there are similar books, but they're not glamorous.

Calculated carelessness is the art of hiding art.

hide the traces of suffering

I don't mind Nicole Kidman's dress work, she looks totally natural.

I read that Angelina Jolie was covered in bruises while filming the movie Tomb Raider.

Naturally, the bruises are covered with makeup, and the main character, Lara Croft, can't get bruises because of the sprezzatura.

"Hide your technique completely and make everything you say and do look effortless." This is essential for glamor.

Glamor is "editing"

How to create a sense of transcendence and imagine a perfect world

How Life Feels Better Living in a Perfect World - Creating a Feeling of Your Perfect Self

Hides cluttered details

This is a photo I borrowed from Jeff Bezos.

At the foot of Jeff's desk

It's the real world of computers and lights and electrical devices.

But in the catalog, the modern, beautiful objects, especially for the home, look like this.

i can't see the code

If you look at a catalog like this, you should have a pretty good idea of ​​how they hide their code.

If you buy this lamp, you can dream of living in a world without cords.

I need mystery and grace

So she's Grace Kelly.

I think it's the most glamorous photo

In the movie "Rear Window," the suspicion arises that she's too glamorous to live in the hero's world.

But the answer is no, because it's a movie.

It's Hedy Lamarr again

Head coverings are very glamorous because, like sunglasses, they hide and show.

Translucent things are glamorous, so everyone wears pearls.

The ones used in the bar are also translucent and glamor neither transparent nor opaque.

Glamor guides us into the world, but it doesn't reveal it.

If the most glamorous person is Grace Kelly, the glass-walled spiral staircase is the most glamorous interior, and the spiral staircase itself is glamorous.

It represents the feeling of rising, not even thinking about tripping and falling.

Glass block walls give a sense of translucency.

Now I'm talking about pure joy, but glamor is also about meaning.

Everyone has an ideal image that is difficult to realize in any culture.

There are contradictions between ideals, they have different standards of principle, while ideals give meaning and purpose to our cultural and personal lives.

So we project our ideals into the Golden Land, into the world of imagination, into the Age of Heroes, into the future.

In life we ​​connect to things

Like a white fence or a perfect house—

It's a perfect kitchen, no bills on the counter

The ideal kitchen is equipped with a VIKING gas range.

A perfect love is symbolized by a perfect necklace or a perfect diamond ring.

perfect car perfect vacation

It's an interior design company called Utopia.

The perfect office - no code here either.

It doesn't look like my office

there are no papers on the desk

Everyone is looking for a utopia

Get rich - if you have an ideal home, you'll have a perfect world.

Dean Koontz has created a wonderful -- Art Deco home theater -- I don't think he did that by accident.

Because Art Deco is a symbol of comfort and relaxation.

But it's not always good for you

What would be a perfect world, what would be ideal, what would you hide?

Is it important?

The Matrix is ​​really a movie about glamor.

I'm running out of time just talking about this movie.

He's been criticized for his glamorous depiction of violence, wearing sunglasses and long coats, walking walls -- doing everything that's impossible in real life.

Margaret Bourkewhite

Filmed in the USSR Fascinating

Everyone looks happy, and they're all beautiful

heading towards utopia

I don't like PETA, but I think the ads are great.

This ad says that fur isn't about glamour, it's about what's hidden.

But it's more important to think about the good or bad of the ideal rather than remembering what's hidden.

Because glamor can be totalitarian and deceptive.

It's not all about "making floor cleaning attractive."

It's a scene from "Triumph of the Will," and it's a great edit.

There are glamorous scenes

Nazism is about glamor

with a very aesthetic ideology

Germany, the West, the world, try to clean up, get rid of anything that isn't glamorous.

So glamor has a dangerous side.

Glamor has pure charm and value.

I'm not against glamor per se.

There's beauty in just what's hidden

There are ways to avoid the dangers of glamor and develop a better understanding of those things.

We just have to follow Isaac Mizrahi's advice, face the manipulation, and admit that we enjoy the manipulation and how it works.

hedy lamarr is more than glamorous

Developed spread spectrum technology

Knowing she's not stupid makes me look all the more glamorous, even if she pretends to be stupid.

David Hockney has this to say about this painting: It makes more sense to know that it took two weeks to create that fleeting splash of water.

You go to a bookstore and you see this book -- "Symphony of Steel." It shows what's inside the Disney Center.

very interesting

There is a fascination with exploring the source of glamor.

There's a wonderful book called "Crowns," a collection of glamorous photographs of the hats black women wear when they go to church.

There is a story of a woman who said, "When I was little, I admired women with beautiful hats.

They're pretty like dolls and look like they're out of a magazine

But everyone worked hard all week

There was joy and sorrow in the hat."

By noticing what went into creating glamor, we can gain a deeper understanding.

thank you

Hello brains!

The reason I call you that is because it wasn't you who decided to join us today.

because your brain

And whether you walk, drive, take a taxi, or cycle, it's your brain that makes the decision.

All actions and behaviors are influenced by the brain.

let's talk about my brain

i was a clever kid

By 18 months of age, he was speaking in writing.

By the third grade, I had achieved high school grades on standardized tests.

All my teachers said that I had very high potential.

At the same time I was struggling

I had few or no friends, my only friends were books.

I quickly became overwhelmed and was empty in class.

always lost things

Trying to focus my brain on anything that didn't interest me was a nail in the bran.

But I was able to study, so no one was worried

When I got to middle school and started taking responsibility for being on time for class and remembering to turn in my homework, studying wasn't enough and my grades started to drop.

My mother took me to the doctor, and after a comprehensive evaluation, I was diagnosed with Attention Deficit Hyperactivity Disorder, which is ADHD.

For those of you who don't know, ADHD has three main characteristics: inattention, impulsivity, and hyperactivity.

Some people with ADHD have a lot of "inattention" factors.

It's a dazed, forgetful person who daydreams.

Some people have many elements of "hyperactivity/impulsivity"

Such people are usually diagnosed early in childhood.

(Laughter) But the most common people are those who have both.

(Laughter) Doctors and my parents thought, given my shiny new diagnosis, that if punishments and sermons didn't work, neurostimulants would work.

I tried the drug and it worked

The first time I took the drug, it was like wearing glasses and realizing I could see without squinting.

I was able to focus

And without doing anything else, my GPA went up a whole point.

honestly it was like a miracle

By the age of 14, I had friends who liked me.

By the age of 15, I had published my first book of poetry.

got a boyfriend

By the age of 17, I realized that I wanted to be a journalist.

The local university has a nomination program for USC.

It was a great journalism course.

So I enrolled at a local university and started taking classes.

I started living with my lover

It was fine at first, but then it stopped working

It started getting harder to get to class on time

I got an A in a statistics class, but I forgot to register, so I didn't get the credit.

I took classes to support my boyfriend's career, but I didn't see myself at all.

I never went to USC

By the age of 21, I had dropped out of college and returned to my parents' home.

Over the next 10 years, I started 15 jobs and quit or got fired.

I lose my trust

Married and divorced within a year

At this point, I was 32 and had no idea how I was going to make a living.

What happened to your potential as a child?

did nothing? No way! I tried harder than anyone I know

didn't even have time to make friends

i was so busy

I had potential

So the failure was clearly my fault

I didn't do what I was supposed to do to reach my goals. To be honest, I was fed up with working hard, with the things that took more effort than anyone else to make a living, and with the fact that I was falling behind.

At this point, I could have given up on myself, or thought that everyone was wrong in thinking I had potential.

But I didn't do it, because I knew that it was my actions that got me this far, and that actions are the brain, and that my brain has ADHD.

Looking at my behavior, I realized that ADHD was still interfering with my life, whether I was on medication or as an adult, and I needed to know why it was happening at all, and, most of all, how to deal with it.

I started doing a little research and found a lot of great information.

I also found a lot of bad information, but that's another time.

Anyway, there was good news in the world.

Web sites, podcasts, lectures, etc., by researchers and medical professionals. The books I've read before -- they've been much more helpful than the self-help books for people with apparently normal brains -- although the brain doesn't have normal or normal neurological function --

But a lot of the books I've found seem to be either too technical or written for parents and teachers trying to come to terms with their child with ADHD.

There weren't many books that felt like they were written for us with ADHD.

So I started a YouTube channel

I didn't know how to do it, but I started anyway.

I almost named my channel "How Not To ADHD," because that was all I could think of at the time.

But my lover, Edward, objected.

In the end, what a lot of people needed was an understanding of ADHD, and I think it was especially needed for people who actually had ADHD.

I was one of them

I used to think that ADHD is the same for everyone.

I thought the main symptom was distractibility.

I thought my ADHD was the reason I stumbled in life.

And I knew that in order to succeed, I had to change myself.

I thought it was impossible for me to be successful just the way I was.

Spoiler I was wrong

Now, let's step back a little and come back to today's topic: the brain.

What I've learned is that it's important to understand the brain you're working with, and that's true no matter if it's the brain of your employee or student, whether it's the brain of your child or someone you love, or your own brain.

ADHD affects five to eight percent of the population, which means statistically speaking, there are between 37 and 60 of us in this room alone.

You can't tell who someone is just by looking at them, but it's fun to watch people try to find them.

(Laughter) At some point, you could meet someone with ADHD, work with someone, have a child with ADHD, or fall in love with someone with ADHD.

I'm sure some of you have already experienced this.

And at some point, you're going to ask yourself, "What's going on in those people's heads?"

I've studied ADHD for two years, I've had ADHD since I was born, and I've had the honor of meeting researchers, doctors, ADHD experts, and tens of thousands of people with ADHD brains all over the world. What can I say to help you understand ADHD?

By the way, many of them helped me with my talk.

First, ADHD is real.

It is not due to bad parenting and discipline

ADHD is a neurodevelopmental disorder

It's currently the most studied psychiatric disorder, and it actually makes quantifiable differences in the brain.

This difference is greater in childhood, but it doesn't go away for most people.

So adults have ADHD too.

While ADHD is being diagnosed at a higher rate, it's not because of more sugar or technology, it's not because of the disappearance of punishment, any more than there is no relationship between pool drownings and Nicolas Cage's appearances.

Correlation is not causation

These are real values

(Laughter) It's ironic that while there's a growing awareness that ADHD is real and that girls, adults, and high school students can have ADHD, there's a lack of awareness that just because you're hyperactive, or you're misbehaving, or you're struggling with classes in school, doesn't necessarily mean you have ADHD.

ADHD is more serious than I realized

The cardinal symptoms of inattention, impulsivity, and hyperactivity don't seem all that serious, and I never thought they were, but in real life, these symptoms make us more likely to have accidents, more likely to be fired, more likely to get divorced, and, importantly, more likely to become addicted to drugs.

I learned that ADHD is a disorder with a range of symptoms.

Raise your hand if you've ever lost your keys or been distracted during a lecture.

Even if you didn't raise your hand, it's true that you were in a daze during this talk.

(Laughter) The problem is that while everyone has experienced symptoms of ADHD, the actual diagnostic criteria are based on how clearly some of the above symptoms affect real life in the long term.

It's just like being sad doesn't mean you're depressed, or being distracted doesn't mean you're ADHD.

And just as depression can range from mild to severe, ADHD can range from mild to severe.

I've also learned that ADHD isn't the right name for those with it.

cause a lot of confusion

Not for lack of attention!

What we have trouble with is regulating attention.

ADHD counselor Brett Thornhill says, "Right now, the ADHD brain is like someone else's remote control, constantly switching between 30 channels.

Sometimes it's hard to concentrate at all, and other times you're stuck in one channel and can't get out of it. In real life, it's easy to think that the reason you don't want to do homework is because you want to play games, and sometimes that's true.

A lot of times, we just want to focus and we just can't.

What we now know is that these problems have to do with the way the brain makes and metabolizes neurotransmitters like dopamine and norepinephrine.

I learned that ADHD can be dealt with quite well.

Taking stimulants increases the release of these neurotransmitters, which helps us focus.

Stimulants are very effective in about 80% of people with ADHD.

And I've learned that medication alone isn't enough.

ADHD not only affects concentration

It impairs higher brain functions such as planning and prioritization, and impairs the patient's ability to continue striving toward a goal.

It influences the regulation of emotions, behavior and sleep.

It's not just one program in your brain that works differently, it's the entire operating system.

it can affect every aspect of life

And there are tons of ways to help

Cognitive-behavioral therapy, coaching and meditation therapy, and regular exercise can also be of great help in understanding your brain.

I found out I had trouble concentrating and found that taking medication helped.

What I discovered for the first time was that I was always full because I had a weak working memory, and that using lists would improve it. I was always late, not because I was careless, but because people with ADHD had a skewed sense of time.

For the most part, what I learned was what I expected: that ADHD is real, that coping with ADHD is important, and that taking medication alone is not enough.

The thing that surprised me when I learned that it wasn't just me, that having an ADHD peer, and connecting with that peer, had a huge effect.

There are people with ADHD in every country and every society in the world.

I'm in France

(Laughter) This fellow is great.

I feel so bad when I compare myself to people who aren't autistic.

Why can't I keep my house clean and finish my projects in time and wait until the last minute?

But by discovering positive elements in the brains of my ADHD peers, I was able to recognize and positively evaluate my own strengths.

But ADHD brains have a lot to contribute to the world.

People with ADHD tend to be generous, funny and creative.

People with ADHD are three times more likely to start a business.

Not only do we think outside the box, but we are often unaware of the frame itself.

(Laughter) When our brains are out of sync, they can struggle, but what the ADHD brain is best at is tackling urgent problems, working with new ideas, wrestling with difficult problems, and being engrossed in projects of personal interest.

The YouTube job that I fell in love with had all of these characteristics.

At 32, I was divorced, miserable, and lost track of what I was doing with my life.

At 33, I started my own business and connected with ADHD professionals.

And now, at the age of 34, I've created a team of volunteers to help YouTube channels.

I got engaged to this wonderful man who helped me create the channel, and he was right by my side, and he's still showing me these slides, and I found out he had ADHD, too.

(Laughter) I'm currently working on a school advocacy initiative to help kids learn about their own brains without waiting until they're 32.

And I'm here with you all doing my very first TEDx talk.

(Cheers) (Applause) Hold on, there's more.

(Applause) Sorry if that sounds like the end, but it's not over yet.

(Laughter) I'm the happiest and most successful person I've ever lived.

what happened? How did you reach your potential?

There were three, and the first was learning about my ADHD brain, connecting with both my own brain and the brains of other people with ADHD.

If you judge a fish's ability to be good or bad by not being able to climb trees, it will live its whole life thinking it's stupid.

Number two, when I learned about my brain, I found a job that involved the brain and fell in love with it.

If you spend a lifetime trying to make a fish learn to climb a tree, it won't know how far it can swim.

I've learned that I can be successful just as I am.

I wish I could find my own sea

Part 3 What I Learned Strategies for Addressing Challenges I Still Face

I'm sorry, this one doesn't have a fish parable.

(Laughter) I think I learned how to swim.

Once you know what your brain isn't good at, you can find solutions.

If we dig deeper than stereotypes and assumptions about people with ADHD, we can learn what ADHD is all about.

It's not about fidgeting and being distracted.

ADHD is a chronically understimulated brain trying to get all the basic stimulation it needs.

It's not procrastination or carelessness

It's a symptom of a lack of control that makes it hard to get things started.

And it's not that people are lazy or don't try hard enough.

It's kind of like a child or an adult whose brain is sometimes uncoordinated, struggling to succeed in a society that doesn't fit them.

Society is a user manual for those who live in it.

We learn how our brains and bodies work by watching the people around us.

If your brain and body work differently, you may feel broken.

So what I'm trying to do is reach out to people with ADHD all over the world and say, "You're not crazy, you're not stupid.

You don't have to try harder, it's not that you couldn't be normal

You're different, you're amazing, and you're not alone."

Even if you don't have ADHD, someone else might.

It could be your employee, your boss, your friend, or someone in this room.

I hope this talk helps people with ADHD understand.

If you have ADHD, welcome as a companion.

(applause) (cheers)

The theme of this session is the miracle of nature, and the overarching theme of the conference is the pursuit of happiness.

Let's connect the two and talk about nature's greatest miracle, healing Let's connect the two and talk about nature's greatest miracle, healing

The human body has an excellent natural healing power, and if you stop the habit that causes the problem, you will show a resilience far beyond common sense.

Daily medical care and everyday life is like mopping the floor with the faucet left open.

And the reason I like this work is that it gives a lot of people new hopes and options. And it's not just about diet, it's about the quest for happiness. Beyond, we see a common message: Our essence is to be happy Our essence is to be peaceful and healthy

Happiness isn't something you get. Health isn't something you get either. Swami rabbis, priests, monks, nuns.

All of these are powerful tools for calming the mind and body, for making change, and for happiness, for peace, for joy.

I studied yoga for many years under a teacher named Sachidananda.

When asked, "Is your teacher a Hindu?"

"It's an undo," I say. It's about being aware of what's getting in your way of health and well-being and allowing your natural healing powers to work.

that's a real miracle

So in that broader context, diet, stress management, mental discipline, moderate exercise, smoking cessation and the patient group connection, I'll touch on those two later. Let's think about vitamins and supplements.

It's not as strict a diet as you might think.

To cure the disease, you need a strict diet to some extent.

There are many options for staying healthy, and good choices can extend life. There are many options for staying healthy, and good choices can extend life.

Lose weight and feel more comfortable Lose weight and feel more comfortable

Our research uses expensive, state-of-the-art technology Our research uses expensive, state-of-the-art technology to demonstrate the amazing power of simple, low-cost, time-honored, natural methods.

I studied heart disease first.

I started doing this research 26, 27 years ago, and at the time, they told me that heart disease was irreversible.

But it turns out that in some cases, it gets better.

This is a then 73-year-old patient who underwent our treatment instead of bypass surgery.

I had an angiogram and there was a stenosis.

This is one of the main arteries leading to the heart, and you can see the narrowing here.

After a year it's getting better Usually it just gets worse

This small change improved blood flow by 300 percent. This small change improved blood flow by 300 percent. On positron emission tomography (PET), blue and black are no blood flow, and orange and white are maximum blood flow. Great recovery is possible without drugs or surgery.

Before treatment, he complained of severe chest pain just by crossing the road.

After a month, the pain was gone. After a year, I was able to step over 100 steps a day on a stepper. After a month, the pain was gone.

Recovery like this is not uncommon. It's a big improvement in quality of life that drives people to change their lifestyle.

Patients in the control group continued to deteriorate overall

It's the normal course of heart disease, but it's not inevitable, and you can recover more than you think.

We also found that the more patients were different, the easier it was to recover from their illness.

It didn't matter what age or severity, older patients recovered just as well as younger ones.

Older patients recovered just as well as younger ones.

A few years ago, I received a Christmas card from two patients who were in a program A few years ago, I received a Christmas card from two patients who were in a program.

My brother is 86, my brother is 95.

I wanted to show you the softness of my body

The next year, this was sent to me. (Laughter)

Can you believe it

In our study, 99% of patients had improved heart disease In our study, 99% of patients had improved heart disease

But it was naive to think that this research would change medicine. But it was naive to think that this research would change medicine.

Breakthrough wasn't enough

Doctors need an income, and they're only trained to do it Doctors need an income, and they're only trained to do it When the insurance system changes, medical practice and education change.

Insurance covers bypass and angioplasty, but until recently excluded lifestyle and diet Insurance covers bypass and angioplasty, but until recently excluded lifestyle and diet

So, at first, through a non-profit organization, I gave instructions to hospitals all over the United States, and most of the patients were able to be treated without surgery.

Effective treatment has saved money, saving insurance companies $30,000 per patient.

Insurance companies have also saved $30,000 per patient. Medicare is training 1,800 doctors for free at the hospitals we train Medicare has a pilot program to train 1,800 doctors for free at the hospitals we train.

A fortune teller says, "Smokers get a discount because it's a short prophecy." (Laughter)

This slide is a good example of what works and what doesn't work for motivation.

"Fear of death" is often said, but it's not a good motivator.

Everyone knows that smoking is bad for you

30% of Americans still smoke. In some countries, 80% of the population smokes. Why?

The answer is to get through the day

As I'll tell you later, the real epidemics of humanity are not heart disease, obesity, or smoking, but loneliness and depression. As one female patient said, "I have 20 friends in my carton."

"The only friend I can count on."

"If it's stolen, there's no substitute." When I'm depressed, I eat too much

Trying to forget the bad things, drinking alcohol, working too much, watching TV

There are many ways to avoid emotional distress, but you have to deal with the cause.

Pain is a symptom, not a cause

The threat of "I'm going to die" is too frightening for the patient to ignore, as is the fear of emphysema or a heart attack, which is too frightening for the patient to think about.

The most effective anti-smoking ad was this: pay attention to the withered cigarettes

Even the title is impotence, not emphysema.

What was the record-selling drug that was launched a few years ago? What was the record-selling drug that was launched a few years ago?

It's Viagra, a lot of people asked for it.

Although it is not mentioned in everyday conversation,

Prescription numbers don't lie

The problem isn't mental, it's vascular. Tobacco, cocaine, greasy diet, stress.

they narrow the blood vessels

What society considers "cool" is actually what causes fatigue, depression, impotence. It's not fun. It's what causes fatigue, depression, impotence.

But if you change your lifestyle, you get more blood flow to your brain, you think better, you have more energy.

These changes can happen in a matter of hours, and there's a study that says, on Thanksgiving Day.

You eat greasy food, and within a few hours your blood circulation will be compromised.

You eat greasy food, and within a few hours your blood circulation is compromised. How do you feel?

will be sleepy

On the other hand, a light meal increases blood flow.

If you have kids, you know that having a baby must have changed a lot of your lifestyle.

You can change your life if you think it's worth it

Paradoxically, the greater the change, the greater the gain, and the sooner you feel a lot better.

This is a worthwhile choice, not to live longer, but to live healthier.

Now about the obesity problem, this is a really serious problem.

Two-thirds of adults are obese Diabetes has increased 70 percent in children and in their 30s over the past decade This is not to be taken lightly Diabetes has increased by 70 percent in children and in their 30s over the past decade This cannot be discounted

This is data from the Centers for Disease Control and Prevention (CDC)

It's not the election result, it's the obesity level of the population.

Starting in 1985, 1986, 1987, 1988, 1989, 1990, 1991, a new segment of 15% to 20% appeared.

Over 25% are obese in Mississippi

Why? It's one way to lose weight. It doesn't last long. That's the problem. (Laughter)

There's no secret way to lose weight. You can either exercise and burn more calories or eat fewer calories.

One way to reduce your calorie intake is by dieting. If you cut out all or certain groups of foods, you naturally lose weight.

Another way is to change the type of food

Fat has 9 calories per gram Protein and carbohydrates have 4 calories

Withholding fat allows you to reduce calories without restricting your diet.

Eating the same amount but less calories due to lower calorie density

Quantity is more effective for satiety than type of food

I get asked about the Atkins diet a lot, so I'll talk a little bit about it, and what Americans get out of the fat.

Calorie percentage is said to be declining, but obesity is on the rise, so fat intake and obesity

It's not irrelevant, Americans are actually eating more fat.

Carbohydrates have increased even more, so the proportion of fat has decreased, but the amount has increased.

Before Dr. Atkins passed away, we had a lot of discussions about Americans eating too many simple sugars.

So to speak, bad carbs (laughs) Sugar, white wheat, white rice, alcohol, etc.

It doesn't fill you up because it has no fiber, it's digested quickly, and it raises your blood pressure.

Insulin from the pancreas lowers blood pressure, but insulin also accelerates the conversion of calories into fat.

The goal is not unhealthy foods like pork rinds or bacon or sausages The goal is not unhealthy foods like pork rinds or bacon or sausages The goal is to replace bad carbs with good carbs Whole Grains Unrefined Carbs

Fruits, vegetables, whole grains, brown rice, etc. are natural and rich in fiber.

It keeps you from eating too many calories, it also helps you feel fuller, and it slows down digestion so you don't have a sudden spike in blood sugar.

Plus it prevents illness

It's not just the foods you leave out of your diet that matter, but the foods you put in.

Just as not all carbs are bad, there are also good fats.

Most of the good fats are fats called omega-3 fatty acids.

Rich in fish oil

Bad fats are trans fats and unsaturated fats found in processed foods and meats.

Everyone, just remember: 3 grams of fish oil daily reduces the risk of heart attack and sudden death by 50 to 80 percent. Consuming 3 grams of fish oil daily reduces the risk of heart attack and sudden death by 50 to 80 percent.

No need to eat more than that. Fish oil reduces the risk of developing cancers such as breast, prostate and colon cancer.

Fish oil reduces the risk of developing cancers such as breast, prostate and colon cancer, but the Atkins diet has its drawbacks.

I don't know anyone who's lost weight on the Atkins Diet, but if you're just looking to lose weight, there are plenty of unhealthy diets like amphetamines and phen pens.

It's important to choose a diet that allows you to lose weight without compromising your health.

It's based on the misconception that if you eat too many simple sugars, you'll lose weight, and if you eat less, you'll lose weight.

Atkins said

“Cholesterol levels have not changed, but research results have changed.”

(Laughter) What would the Atkins diet do to your heart?

At first you can see a good quality red

This is a reviewed paper published in the journal Angiology.

The diet I recommend doesn't reduce the redness, but on the other hand, after a year, the redness has decreased and the blood flow has worsened.

As a result, even if you lose weight, you put more strain on your heart.

In a study done at the Atkins Center, 70% of the participants had constipation, 65% had bad breath, and 54% had headaches.

Even if you lose weight and become more attractive and people start to approach you, if you get too close, you'll be in trouble.

(Laughter) Now, to get serious, there's one girl who started the Atkins diet and died within weeks of bone disease, kidney disease, and other complications.

Waste products are removed from the body through exhaled breath, the intestines and through sweat Waste products from the body are removed through exhaled breath, the intestines and through sweat

So diets like this cause body odor.

The optimal diet is low in fat, low in bad carbs, high in good carbs, and good in fat.

The effects are very different.

There are ecological reasons why we should eat lower down the food chain, like deforestation in the Amazon and the four billion people who live on a dollar a day, and there are moral reasons.

Besides health, there are many other benefits of this diet.

There are many other benefits of this diet besides health, and we're about to publish a causal link to prostate cancer, in collaboration with the Sloan Kettering Institute and the University of California.

Among men diagnosed with prostate cancer, 90 men without surgery

We divided them into two groups, one of which was a comparison group, and we can't create a comparison group for research, because we always treat breast cancer, for example.

All of the experimental group improved and did not need treatment at all, and six of the comparison group required surgery or radiation.

When we looked at prostate-specific antigen levels (PSA), a marker of prostate cancer, everyone in the comparison group got worse, but everyone in the experimental group improved.

the difference was obvious

This led me to start thinking about how changes in PSA levels in all groups were related to changes in diet and lifestyle, just like we've seen in arteriosclerosis.

It turned out that there was a dose-response relationship, and big changes were needed to lower the PSA levels.

The next question I had was that the PSA was changing,

Does it affect tumor growth? So we sent the experimenter's serum to UCLA.

They added it to prostate tumor cells grown in tissue culture, and the experimental group had more than seven times the tumor growth inhibition than the control group, 70 percent versus 9 percent.

Finally, I wondered if there was a relationship between improved quality of life and tumor growth in any group, and again, to my great surprise.

We found a similar relationship: the more we improved our lives, the less tumor growth we had.

I ended up getting an MRI and an MR spectroscopy.

This patient's tumor is shown in red. One year later, the area is visibly better and the PSA has decreased.

If it works for prostate cancer, it should work for breast cancer.

Making lifestyle changes while receiving usual care will reduce the risk of recurrence.

Finally, let's talk about the pursuit of happiness. Numerous studies have proven that depression is a serious disease of our time, and that depressed people who are lonely and depressed are much more likely to fall ill or die suddenly because they tend to smoke, eat too much, drink too much, and work too much.

And loneliness and depression, for unknown reasons, have been found to be three to 10 times more likely to become ill or die suddenly.

Depression can be treated, it needs to be addressed

On the other hand, deepening friendship is also healing.

Including physical intimacy, I believe that healing and sexual energy are actually the same thing in different forms.

Friendship, altruism, compassion, merit, the truths that we've talked about in all the different religions and cultures of the world, and if you don't pay attention to the details, you'll realize that these are common, real truths that are irreplaceable to us, freeing us from suffering and disease.

In that sense, it should be used to a large extent.

This is a study done by David Spiegel at Stanford University.

Patients with metastatic breast cancer were randomly divided into two groups Patients with metastatic breast cancer were randomly divided into two groups

One of the groups was a support group, and we met for an hour and a half each week.

It was a space full of empathy and affection, where we could talk about the hardships of living with breast cancer, share our accumulated emotions, and share with others who were battling the same disease.We continued to meet once a week for a year.

Five years later, these women lived twice as long.

The only difference between the groups was the meeting.The results are listed in The Lancet.

Other studies have shown the same results

Deepening friendship is healing

The etymology of the word healing is "to fill"

The word yoga is derived from Sanskrit

It means to merge, to unite, to unite. And the last slide is from a swami we studied together for many years.

The last slide is from a Swami we studied with over the years.

A few years ago, we had an oncology and cardiology case review at the University of Virginia.

Finally someone asked Swami, "What is the difference between sickness and health?"

Swami then wrote "ILLNESS" and circled the first I and then wrote "WELLNESS" and circled "WE".

So to wrap up today's story, all of bond, unity, and love is healing All of bond, unity, and love is healing.

Thank you. (Applause)

A talented young herbalist named Xu Xian was in trouble.

I had just opened my own herbal shop and was supposed to get drunk on the wine of victory.

I bought some goods from my old apprenticeship, but my husband got angry and sold me rotten medicinal herbs.

While Xu Xian was at a loss as to what to do with the useless medicinal herbs, patients flooded into the store.

There was an epidemic in the town, and Xu Xian didn't have any medicine to treat the patients.

When Xu Xian was about to panic, his wife, White Girl, mixed rotten herbs and made medicine.

Instantly healed the townspeople

Even Xu Xian's old husband had to buy back the rotten herb to cure his family's illness.

Soon, a Zen master named Fakai came to Xu Xian and said that his house was haunted by a monster.

They said that the monster was a white girl.

Xu Xian laughed

A kind and wise wife cannot be a monster

Hokai still said

"On May 5th, when the monster's power is at its weakest, let the white daughter drink Yuhuangshu.

If it's not a monster, there's no harm."

Xu Xian politely refused.

As the day drew near, Xu Xian decided to give it a try.

As soon as Shiro Musume took a sip of Yuhuangshu, she felt unwell and rushed into the bedroom.

Xu Xian prepared medicine and went to see how things were going.

It wasn't his wife in his hospital bed, but a white snake with a bright red, forked tongue.

Xu Xian was so shocked that he collapsed and died.

When the white girl woke up, she instantly realized what had happened.

In fact, Shiro Musume was an immortal serpent with great magical powers.

With that power, she took human form and improved her and her husband's fortunes.

Even with her magical powers, Xu Xian could not be brought back to life, but Bai Zi Zi had a secret plan to save her husband. A medicinal herb that grants longevity and even revives the dead.

The dead rode the clouds to the Kunlun Mountains, from there they walked through gates and arch bridges until they finally reached a silver bridge with a sign that read, "Qufon Bridge."

On the other side of the bridge, two disciples of the old man in Antarctica were guarding medicinal herbs.

The white girl disguised herself as a Zen master and told her disciples that she had come to invite an old man from Antarctica to a gathering of the gods.

While the disciples were delivering the message, the white girl picked the leaves of the medicinal herb and ran away.

When the disciples realized they had been deceived, they chased the white girl.

The white girl spat out a magic ball from her mouth and threw it at one of her disciples.

Another one approached, so I put the herb under my tongue to protect it, but the magic caused everyone to return to their true form.

When the white girl was immobilized with the long beak of a crane, an old man from Antarctica appeared.

I asked him why he risked his life to steal medicinal herbs, even though he said he was immortal.

The white girl spoke of her love for Xu Xian

Knowing that she was a monster, even if Xu Xian didn't live with her, she was determined to bring Xu Xian back to life.

These two had a past life connection more than a thousand years ago.

The white girl was a little snake, and when she was about to be killed by a beggar, she was rescued by a kind passer-by.

Xu Xian in my previous life helped me

Impressed by Bai Zi Zi, who willingly gave his life for Xu Xian, the old Antarctic man allowed Bai Zi Zi to go down the mountain with the herb of immortality.

The white girl returned home and brought Xu Xian back to life.

When Xu Xian opened his eyes, a smile broke out from his stiffened face.

Monster or not, Xu Xian was happy because he got to meet his wife.

These six are going to die in a strange way from now on, but they don't know yet.

One by one, they show off their splendid predatory arts...

become prey to carnivorous plants

Worldwide, more than 600 species of plants get their nutrients from the common sources of sunlight, water, and soil, as well as insects, microbes, and even frogs and mice.

Scientists believe that the acquisition of insectivority in plants has occurred at least six separate times on Earth, and that the insectivorous adaptation could be a great advantage for plants.

Carnivorous plants grow in highly acidic soils that are deficient in nitrogen, phosphorus and potassium, which are important nutrients for plants.

In such a hostile environment, plants that can lure, capture, and digest prey have an advantage over plants that rely solely on soil as a source of nutrients.

Let's take a look at a swamp where pitchers dominate, almost inhospitable to life.

Attracted by the jug-shaped pitcher leaves' bright colors and captivating scent, flies approach to suck the nectar.

But the nectar from the pitcher leaves contains coniine, a powerful anesthetic for insects.

When the coniine kicks in, the flies slow down, trip, fall into the liquid at the bottom of the funnel, and drown.

Enzymes and bacteria in the liquid slowly break down the fly, breaking it down into very fine particles that the plant can absorb through its leaves.

Occasionally, even larger prey tumbles down the lethal funnel of the pitcher.

A second victim faces off against a sticky sundew

The small leaves of the sundew plant secrete a thick mucus.

Ants quickly become trapped in this sticky liquid.

As the ant struggles, it begins to be broken down by enzymes.

Specialized tentacles sense the ant's movements and wrap around it, squeezing it together in a suffocating manner.

When an ant suffocates -- which takes less than an hour -- the tentacles reopen and wait for the next victim.

2 now, 4 more

Our next target ends life in the underground spirals of Genlythea.

This organism seeks food by entering through crevices into what looks like roots.

But it's easy to get lost in a hairy maze.

The inwardly curved hairs prevent their escape and guide them to the confluence, a space containing digestive enzymes and fatally low in oxygen.

In the murky waters of a nearby pond, tadpoles unwittingly swim toward raccoons, the most agile carnivorous plants.

When the tadpole touches the raccoon "hair", within milliseconds the flap opens and sucks in the tadpole.

A tadpole with only half of its body trapped struggles to free itself, while the part that is taken up by the plant is digested.

Over the next few hours, the tadpole's struggles attract the plant's predatory behavior, and each time it is taken up by the plant, it is slowly digested alive.

Now this beetle is enraptured by sweet-smelling nectar.

As the beetles get closer and closer to the source of their nectar, they land on the leaves of the world's most famous carnivorous plant.

Fine hairs on the surface of the leaves sense the landing of the insect and cause the Venus flytrap's mouth to snap shut.

The thorns on the leaves interlock and decide the fate of the insect.

Once closed, the leaves act like an external stomach, digesting the insect's soft tissue.

A few days later, when the leaves reopen, all that's left is the insect's exoskeleton.

Let's take a look at the last surviving mayfly

When approaching a violet violet, the mayfly heads for the flower, which signals it above the ball of sticky liquid.

The mayfly lands on the petals, sucks the nectar, and flies off unscathed.

Long flower stalks keep certain insects away from predators, allowing them to distinguish pollinating insects from simple prey.

Thus, mayfly lives a long and fruitful life— oops.

I'm going to tell you a story of a story

The reason I want to tell you this story is because I think you should know that sometimes the stories we tell each other are more than fairy tales and entertainment and tales.

Stories are also vehicles for delivering the seeds of ideas and ideas across societies and eras.

What I'm going to tell you is how stories originated in some of the most advanced technological achievements of our time, and how stories can originate in the profound transformations that are yet to come.

The story goes back 300 years, when Galileo Galilei learned of a new Dutch invention: a long tube with two pieces of molded glass attached to either end that allowed him to see beyond what the human eye could see.

When Galileo pointed his new telescope toward the sky, and especially toward the moon, he discovered something incredible.

This is part of Galileo's "Report of the Stars," published in 1610.

In it, Galileo revealed his discovery to the world.

Galileo discovered that the moon was more than just a celestial body that wandered the night sky. Rather, it was a world of towering sunlit mountains and dark expanses of Mare, the Latin word for sea.

Once people discovered the moon as a new world, people immediately started thinking about how to travel there.

And just as importantly, I started writing stories about how it would happen and what the journey would be like.

One of the earliest authors was Francis Godwin, Bishop of Hereford.

Godwin wrote the story of a Spanish explorer named Domingo Gonzalez, who was stranded on the island of St. Helena in the middle of the Atlantic Ocean.Gonzalez, trying to get home, developed a new invention, a device that could be powered by wild geese, could fly, and eventually go to the moon.

Godwin's book, Man in the Moon, was published anonymously after his death in 1638, perhaps because it contained many controversial ideas, including supporting the heliocentric cosmology of the sun at the center of the solar system, and proposing the pre-Newtonian conception of gravity, in which objects lose weight as they move away from Earth.

Not to mention his idea of ​​a moon-going goose device is also controversial.

(Laughter) The idea of ​​traveling to the moon with a goose device might not be particularly insightful or creative technology today, but the point is, unlike Johannes Kepler's writings, which rely on fantasy and magic, Godwin's account was about reaching the moon through human invention.

The idea that mankind could build a device that would enable them to travel to the skies was sown as a seed that would be passed on to our minds for generations to come.

This idea was taken over by a contemporary, John Wilkins, still a young Oxford student who would later become one of the founders of the Royal Society.

John Wilkins took Godwin's idea of ​​space travel seriously and wrote a non-fictional philosophical treatise, not another story, entitled "Discovery of New Worlds on the Moon, or Attempts to Prove the Possibility of Other Liveable Worlds on That Planet."

Now, if we focus on the word "viable,"

This idea may have been a strong motivation for people to build devices that could take them there.

In his writings, Wilkins is still known today as the first non-fiction book to seriously consider a number of techniques for spaceflight and discuss the possibility of a trip to the moon.

Among the stories that followed, notable was Cyrano de Bergerac's Travels to the Moon.

By the mid-17th century, the ideas of those who wanted to build machines that could travel to the heavens had grown in complexity and technological breadth.

But in the late 17th century, this intellectual progress virtually stalled.

Stories about reaching the moon were being made, but they were again relying on old ideas of fantasy and magic.

Why

Because with Newton's discovery of the law of universal gravitation and Robert Hooke and Robert Boyle's invention of the vacuum pump, people understood that there is a vacuum between the planets, and the same between the Earth and the Moon.

At that time, there was no way to overcome this, and there was no way of thinking about how to overcome it.

That situation lasted for more than a century, and little intellectual progress was made in the idea of ​​space travel to the moon. It wasn't until the Industrial Revolution came on that things changed, with the development of steam engines, boilers, and most of all, pressure vessels.

So people now have the tools to figure out how to build a capsule that can withstand the vacuum of space.

With this change of circumstances, the next great story of spaceflight was written by Edgar Allan Poe in 1835.

Today, when we think of Poe, we think of Gothic short poems and literary works such as "The Heart of the Tell" and "The Raven."

But he identified himself as a technical thinker.

He grew up in Baltimore, the first city in America to be lit by gas lamps, and was fascinated by the technological innovations all around him.

He considered his greatest work not to be a gothic tale, but an epic prose poem, "Eureka," in which he elaborated his own views on the structure of the universe.

In his stories, he detailed fantastical techniques, such as devices and gimmicks, and his most influential short story on this front was The Unique Adventures of Hans Pfahl.

The story is about an unemployed fuigo craftsman from Rotterdam, crushed by life -- that's Poe himself -- and heavily in debt. He decides to build a sealed balloon cage that can be launched with dynamite.

Importantly, he wasn't the only one to create this story, and the afterword to the story clearly notes that it was influenced by Godwin's "Man in the Moon" more than 200 years ago, calling it "a bizarre and somewhat original book."

While a hot air balloon trip to the moon might not seem to be much more technically sophisticated than a goose flight device, Poe described in detail how the device was constructed, and the trajectory dynamics of space travel, in such detail that the trajectory was illustrated in the world's first spaceflight encyclopedia in the 1920s as an example of a flight plan.

And this attention to detail, or, as he puts it, "factuality," inspired the next great story, "From the Earth to the Moon," by Jules Verne in 1865.

The work left behind an astonishing legacy, and one that bore striking similarities to the trip to the moon that happened 100 years later.

For example, in that story, the first trip to the moon started in Florida, with three people on board, a one-way journey of three days, and those specifications were adopted by the Apollo program.

To pay tribute to Poe's influence, Verne in the book identifies the organization working on lunar exploration projects as the Baltimore Cannon Club of Baltimore, as he sets out to take action to conquer the moon.

Everyone shouted, "Cheers to Edgar Poe."

Verne's story influenced and inspired early rocket scientists in the same way that Verne was inspired by Poe.

Russian and German liquid rocket pioneers Konstantin Tsiolkovsky and Hermann Oberth both read "From the Earth to the Moon" in their teens, decided to pursue a career in spaceflight, and remained involved in the challenges of making that story a reality.

Verne's story isn't the only 19th-century feat that has enduring impact.

H.G. Wells' book "War of the Worlds" directly inspired Robert Goddard, a young Massachusetts man across the Atlantic.

One day in the 1890s, after reading The War of the Worlds, Goddard wrote in his diary that while he was resting between pruning cherry trees on his family's farm, he had a vision of a space rocket taking off from a valley and rising straight toward the moon.

He wrote that in that moment and place, he decided to dedicate his life to developing a spacecraft that he had witnessed in his mind's eye.

and made it

Throughout his career, he continued to celebrate the day of the cherry tree event as an anniversary. At the same time, he regularly reread the works of Verne and Wells for inspiration and determination that led him to work diligently for decades on developing a liquid-fueled rocket, the first step needed to realize his dream, which flew for the first time in 1926.

After reading "From the Earth to the Moon" and "War of the Worlds," the pioneers of astronautics decided to dedicate their lives to solving spaceflight problems.

Their papers and achievements, in turn, inspired the early spaceflight engineering community and the first spaceflight projects, and thus the chain of influence continues from Godwin, Poe, Verne, to the Apollo program, and to the modern people involved in spaceflight.

So why did I tell this series of stories?

Is it just because I think it's cool, or just because I'm strangely fascinated by 17th and 19th century sci-fi stories?

partly yes

But I believe that the cultural processes that can be gleaned from these stories can be applied not just to driving space travel, but broader technological innovation.

I worked as an economist at NASA, where I spent some time thinking about the economic origins of our space-bound activity.

If we look before the investments of billionaire tech entrepreneurs, before the Cold War space race, before the military invested in developing liquid-fueled rockets, the economic origins of spaceflight lie in stories and ideas.

It was in those stories that the concept of spaceflight was first articulated.

And with those stories, humanity's future in space began to be handed down from heart to heart, forming an intellectual community that spanned generations, experimenting with the idea of ​​a spaceship and finally making it a reality.

This process has been going on for 300 years and has shaped spaceflight as a culture.

Over the course of hundreds of years, so many people have become involved in that culture.

For hundreds of years some of us have looked up at the stars and wished we could go there.

And for hundreds of years, some of us focused on developing the concepts and systems needed for such space travel.

I wanted to tell you about Godwin and Poe and Verne because I think their stories teach us the importance of telling stories about the future in general.

These stories don't just convey information and ideas.

Stories breed passion, and passion drives us to spend our lives working on important projects.

So these stories can and do influence social forces and technological forces into the future, across the centuries.

I think we need to realize and remember this when we speak.

Let us try very hard to stop telling tales of only ant-utopian future paths, because the more we tell ourselves taunting t-utopian futures, the more we risk sowing the seeds of t-utopia.

Instead, we need stories that sow the seeds of something else, not the seeds of utopia, but at least the seeds of projects that drive technological, social, and institutional change.

If my idea that storytelling could transform the future seems fanciful and impossible, I think you need to think of space travel to the moon as an example of an idea born in the 17th century that has been culturally propagated for over 300 years before becoming a reality.

That's why we need to write new stories so that when we look back 300 years into the future, we can say what inspired them to take us to new heights and new lands, what new paths and possibilities they showed us, how they made the world a better place.

thank you

(applause)

The present age is said to be the age of the environment, biotechnology, and IT.

We are living in an age of diversity, and certainly an age of change, as never before in the history of human life on Earth.

We all know it, but it can be a little confusing to truly understand.

So, as a first step towards understanding, I've put together some material.

So I'm going to look at the 50 years that you're all living through, and people are interested in the generations that come before and after. Parents, children, things that you can be a part of making changes in the next few decades. You'll see an increase in population beyond what it was when you were born.

It's something that has never happened before, and it's a terrible thing.

I don't know what the future holds for humanity.

Next is the relationship between animals and humans, see the left side of the diagram.

What I call "the human share," or the "natural share" of people and livestock and pets, and all other wild animals, vertebrates, other birds, land and air creatures, excluding aquatic creatures.

Of course, 10,000 years ago, at the dawn of civilization, the "people's share" was less than 0.1%.

There's a white area in the middle of the curve in the graph. This is your 50-year epoch. People, livestock, and pets collectively make up 97 percent of all life on Earth, and other wild animals make up only 3 percent.

And the biggest problem has happened in the last 25 years, a whopping jump from 25 percent to 97 percent.

It's a truly striking sight, because we see that we humans reign over all life on Earth. We play with life like the capricious gods of Greek mythology, and we don't have much wisdom.

The third graph is Information Technology (IT)

It's a representation of Moore's Law of information density, but it's also a good indicator of many other things in IT, like computers, their uses, the Internet, and so on.

This is the size of the Earth on the same axis (Laughter).

I don't need a detailed explanation.

The first is the conflict between man and nature. Man wins and nothing more is gained.

The second is population growth. For those looking to enter a growing industry, wildlife conservation doesn't look like a promising prospect. The population is growing and will continue for some time.

Obstetricians, morticians, farmers, realtors are all going to thrive. They all have to do with the human body. They need food, transportation, housing.

will grow significantly

Then there's the size of the planet, and the prospects for these industries and those that balance the planet seem pretty slim.

But as it turns out, that's the next step.

The goal is to create a sustainable ideal world for the next generation when my children are the same age as I am now, and you probably agree.

It's a hopeless dream. Technically achievable. Economically achievable. But politically, it's about human habits and institutions.

The habitual institutions of the past are ill-suited to the future, but they exist and must be confronted. I spend 15% of my time saving the world, and the other 85% doing what I love to do and other daily activities.

In this 15 percent, we're looking at human thinking, or thinking skills. We're trying to free children from a school that's bombarded with information and doctrine. We should be able to think for ourselves, ask hard questions, debate important issues, and not just take what's in the book, but develop broad, creative thinking.

The school system is so flawed that it doesn't appreciate what's important in life and how to maintain civilization, it appreciates cramming and rote memorization.

Due to time constraints, I won't go into this topic any further, but this is a broader issue. One thing I can say is that the future is going to do more with less effort.

What our ancestors did was human-powered, but today's lifestyles are thought to require enormous amounts of energy.With today's amazing technology, we can be more efficient at conserving resources, recycling, and so on.

A quick introduction to what we have been working on

The human-powered aircraft "Gossamer Condor" led me down this path in 1976, and won the Kramer Prize in 1977, making a name for itself in aviation history.

This is a giant pterosaur replica, no tail.

Making it fly in a straight line was like shooting an arrow with a feather at the tip, which was very difficult, but it gave me a great sense of awe for nature.

This is a full-scale model of an original creature.

I've developed all sorts of vehicles on land, in the air, on water, and most of them have electronic components and power systems.

This is a solar-powered plane. It flew 265 kilometers between France and England with a single person on board. It was an event that symbolized the vital role that solar cells would play in the future. Then we developed a solar car for General Motors, the Sun Racer, which won a competition in Australia.

A lot of people's attention was focused on electric vehicles, and they considered how to use them. A few years later, I made a proposal to GM.

So with that out of the way, I'm going to show you the first two minutes of the video, about the small reconnaissance plane, and you can see how it gradually gets bigger.

(Narrator) The small aircraft "AV Pointer" is a military reconnaissance aircraft. It works like a pair of mobile glasses. It is controlled remotely by the operator using cutting-edge miniaturization technology.

Send high-definition video to your operator

Autopilot with built-in GPS is possible Robust so it won't break even if it lands autonomously

Modern gliders are extremely capable

For every 30 centimeters of descent, about 18 meters of horizontal flight is possible.

It's powered solely by the energy we get from the atmosphere, using the power of the sun, the power of nature.

Humans and birds in the sky have received the blessings of nature as renewable energy.There is a record of sailing over 1,600 kilometers and reaching an altitude of 15,000 meters.

(music) "Solar Challenger" was created as a symbol that solar cells can generate powerful electricity and will be the energy source for the world of tomorrow.

In 1981, he flew 260 kilometers between Paris and England using only solar energy, laying the foundation for Pathfinder.

(music) These vehicles show us that ideas and technologies can be very useful in the development of breakthrough energy efficiency. They can bring about a desirable balance between technology and nature.

Buckminster Fuller declared, "There are no passengers on Spaceship Earth, only crew members. We crew members can and should do more with far less consumption."

Now let's move on to the second one-minute video, and I'm going to quickly show you the pathfinder's unmanned aerial vehicle's past flight in Hawaii.

It's amazing, because with just a little bit of sunshine and an ultra-lightweight aircraft, we were able to get this far.

This is part of a long-term program funded by NASA.

It's a tight-knit team that pulls together to produce amazing results like this flight.

We're developing an even bigger one, 66 meters long. It's a medium-sized plane with regenerative fuel cells. It charges up surplus electricity during the day and consumes it at night. It can maintain an altitude of 19.5 kilometers for a month.

(Music) Narrated by project manager Ray Morgan.

It's all about teamwork. Ray leads the program.

At the end comes something that he was very pleased with the success of.

(Ray Morgan) I'm done with my seven-month assignment in Hawaii.

For the members from the mainland, it was a painful day away from home.

From Hawaii and the military, I was treated with kind support, gentle trust, and a sense of camaraderie. (Music) (PM) From here on... (RM) It was a fun and unforgettable experience.

(PM) We tracked the craft live with an online infrared scanner as it flew through the stratosphere. It flew without polluting the stratosphere. That was the goal in the first place. it's close to the table

I wanted to fly it here and show it to you, but it didn't happen.

let me show you another video

In the video, I showed you a reconnaissance drone called "Pointer," which weighs about 4 kilograms. It was developed by Matt Keenan, and he's done a really good job. The servos are usually 18 to 25 grams, even if they're lightened.

Matt Keenan When you're ready Matt Keenan Okay, I'll skip it, but first I'll make sure it's on the screen.

See it through the eyes of a drone Be a mouse or ride a drone and pretend you're looking through the camera

(MK) Switched on

(PM) I'll switch to the camera, let's go.

(MK) Brighten up the lights

(PM) That's right. The brighter the better, the easier it is to control the aircraft.

(MK) I will make several round trips back to the venue

let's go

(Applause) (PM) The camera worked fine at first, but for some reason... oh, it worked.

It was only for a minute, but it's okay to do that towards the end of the flight.

(MK) Do classical acrobatics

yes it went well

It doesn't hurt even if we collide

(laughs) okay

(Applause) Thank you, thank you.

(Applause) (PM) We're going to do it like a TV commercial, and what we're going to bring to you is our latest upgrade, and it's just six inches -- it's 15 centimeters.

Matt's plane was on the cover of Popular Science last month, and it showed us the future of this technology. Eventually, something of this size could carry GPS and a video camera. Already, the plane has flown 14 kilometers at 56 kilometers per hour, using only a small battery.

Technology is advancing day by day

Only on the way to great achievements

This plane doesn't have a camera, but I can show you what it's capable of.

(MK) will skip

(smile)

(MK) Excuse me.

(Audience) Okay. (Applause) (MK) If you're watching, please pass me this way.

(PM) I hit a wall because it's in a weird place.

(Laughter) Now you know what's going on.

An ongoing project is a flapping thunderbolt-sized aircraft under contract to the US Defense Advanced Research Projects Agency, jointly developed by Caltech and UCLA.

I don't know what will happen in the future, I don't even know if it will be practical.

But as with any basic research, even if we're forced to go beyond what we have today, we can do it with microtechnology and nanotechnology.

You can create amazing things. You just have to be aware of what nature has already accomplished. When you get involved in micro-technologies, you realize how much you can learn from nature.

There is no failure, because once you fail, you can't leave offspring.

Nature gives us only success stories. Both humans and birds are products of nature's success. Humans learn a lot from the fascinating subjects that nature presents.

Now, to wrap up, let's think about the big picture again, and I'd like to show you two slides to give you an objective perspective.

I read the first one aloud, and the last three sentences say everything I want to say.

"On this unique earth, the chance of hundreds of millions of years has created a complex, wondrous, fragile, and extraordinary thin film of life. Humans, a recently born race, have suddenly defied the ever-present restraints of nature, increased in numbers, increased their skill and intelligence, and ascended to a position of tremendous power. Now it is the humans who wield the paintbrush."

It's a serious matter. Humans aren't smart. They're technically smart, but they're not smart enough to know where they'll end up.

Inspired by this article, I decided to pick up my paintbrush.

Every 25 years, I paint a picture, and this is one of them, to show that the earth is no longer growing.

It's kind of a chronology, and it's completely bullshit to scale, but there are trilobites and dinosaurs, and at the end there's cave humans, and after Pterosaurs, there's flying birds.

We have a civilization with guns on our TVs, traffic jams, power plants, digital dots and beyond, I don't know.

So I drew a robot cockroach and a wild cockroach, but you can draw whatever you want.

This is a warning, not a warning, and we need to take it seriously.

This isn't 100 or 500 years from now.

We're talking about the next 10 years, and the next 10 years, and we don't have time to decide the future.

If we can successfully agree on what to do with the world, then when our children are the same age as you are today, we will have an ideal and sustainable planet. I told you this was not a prediction, it was a warning.

I personally believe that the intelligent life on earth that will survive in the future will be silicon, not carbon.

I don't know what kind of future awaits

The last little glimmer of hope I'll show you is a totally impractical flying craft. It flaps its wings and is powered by rubber bands. So let me show you.

(MK) 32 grams Excuse me, 1 gram.

(PM) I almost broke the ceiling last night with too many rubber bands.

Weighing about a gram, this tube is hollow and about the thickness of a piece of paper.

Don't worry, it won't hurt even if you bump into it.

But if you grab a flying machine, it will break, so please watch over it gently.

If you crash, please pretend you're a wooden Indian.

Well let's fly first

I feel like this flight epitomizes the spirit of TED.

(Applause) In case you're wondering, "Is this practical?" -- (Laughter) (Applause) Sorry, I'll have to send someone to change the lightbulb.

(Applause) But I'm just going to say two things. There would have been no Impact vehicles, no zero-emission vehicle regulations in California.

These and similar inventions were probably 10 years too late, and I didn't realize at the time that I was doing research-based, team experiential learning, which is what the education system is trying to accommodate today.

So this aircraft is important as a symbol of that.

And one more thing, I hope you can see this aircraft as a symbol of TED's continuing learning attitude, thinking about technology and nature. And I think it's possible that this aircraft will make this conference, which encompasses all of that, more important than anything that's happened in this country in the last decade.

Thank you. (Applause)

The first kiss Her mouth fell into mine Like summer snow Like the fifth season Like a brand new paradise Like Eden when God complained To the flowing slope of Eve's ass Her kisses hurt like that So it was like she mixed the sweat of an angel with the taste of tangerines Really my mouth was a helmet that had been plastered with secrets all along My mouth was a dead end with teeth Slightly illuminated My heart was a hard shell in the depths of darkness But her mouth was as clear as a light blue Cadillac Full of canaries A toucan was driving — indeed, when her lips kissed She said bright feathers Wildly and precisely As if teaching a seahorse how to speak Her mouth so deliberately lured the first vowels out of my throat My brain I hit it like that until it turned into a piano and thundered loud It's really like her tongue was the seventh moon of Saturn And that's how hot, hot, cold, spinning and spinning Turned me into a rapturous planet Turned me into an ecstatic planet On one side the sun And on the other there's a night with her slow hand pouring One fire blows the other kite

Her kiss was like Mother Nature rushing to open the moon like a gift And finally I could feel the shadow slipping from my present wrist.

It was like that, but it was sweeter Like a riot of monks with prosthetic legs riding a hopping Up, up, this way, this way Without falling, up and up, that kind of naughty thing But, really, when I said that kiss, both lips were completely devoted to the world Like a peace corps, like a free shop Always, forever, no locks, no walls, just doors, just like a new city That's how it really was

It's an honor to stand here

Much has been said about the hopes and dangers of technology.

I'm interested in both sides

If we could convert 0.03% of the sunlight that reaches the earth into energy, we could cover all of the projected demand in 2030.

We can't do that today because solar panels are heavy, expensive and inefficient.

Nanotechnical design has the potential, at least in theory, to be lighter, more economical, more efficient, and able to meet all of our energy needs from renewable sources.

Nanotech fuel cells make energy ubiquitous

A key trend is decentralization, moving away from centralized nuclear power plants and liquefied natural gas tankers to distributed resources that are environmentally friendly, efficient, high performance, and not at risk of bankruptcy.

As Bono so eloquently said in his last talk, for the first time, we have the tools to deal with the long-standing problems of disease and poverty.

Many parts of the world are moving in that direction.

In 1990, there were 500 million poor people in East Asia and the Pacific, but today there are less than 200 million.

The World Bank predicts that in 2011 there will be less than 20 million people, a 95 percent decline.

Bono's comment about linking the birthplace of hippies, Haight-Ashbury, to Silicon Valley was hilarious.

Coming from the high-tech community in Massachusetts, we were hippies in the '60s, but we hung out at Harvard Square.

I'm going to tell you today that disease and poverty are quite possible to overcome, but it takes willpower.

Kevin Kelly talked about accelerating technological evolution.

This is also a subject that has interested me for 30 years.

The technology must make sense when the project is completed

The world inevitably becomes a different place when new technology comes along.

A lot of inventions fail because R&D departments fail to deliver. If you look at business plans, in many cases, if the conditions were right to make what you set out to make, they would have succeeded.

I became an avid researcher of technology trends, tracking the emergence of technology over time, and began building mathematical models of it.

It eventually began to walk on its own

Together with 10 colleagues, we collected important metrics and built models for technologies in various fields.

It's often said that predicting the future is impossible.

It's hard to say whether Google's stock will go up or down in three years.

It's hard to say which WiMAX CDMA G3 will be mainstream in three years.

On the other hand, we can predict pretty accurately what the MIPS unit price will be in 2010, or what the cost of DNA sequencing will be in 2012, or what the cost per megabyte of wireless communication will be in 2014.

There is a very smooth exponential curve that governs computational cost, performance, communication speed, etc.

I'll give you a few examples, but there are theoretical reasons why technology develops exponentially.

When most people predict the future

We think linearly, we think of today's tools, of today's speed of progress, as a continuation, and we don't consider exponential progress.

The genome project was questioned in the '90s.

With the best PhD researchers in the world, the best equipment, and only 1 in 10,000 going, how can you do it in 15 years?

A decade later, skeptics still persisted, saying, "We're two-thirds of the way through, and we've only analyzed a fraction of the entire genome."

But that's the nature of exponential growth, and once it's on track, it explodes.

Most of the project was completed in the last couple of years.

It took 15 years to sequence the genome of HIV, 31 days for SARS.

That's why we're getting more power to solve these problems.

A few examples show how pervasive this phenomenon is.

The frequency of paradigm shifts, the frequency with which new ideas are introduced, is doubling every decade according to our model.

All the graphs are logarithmic graphs, and every time you go up one step, it increases by a factor of 10 or 100.

It took half a century for the first virtual reality technology, the telephone, to become ubiquitous.

mobile phone is 8 years old

If you plot the different communication technologies on a logarithmic graph, TV, radio and telephone took decades to become popular.

Modern technology PCs and webs and mobile phones are less than 10 years old.

This is an interesting chart because it shows a fundamental reason why the evolutionary process accelerates, whether it's biology or technology.

Through interaction, you create competencies, and you use those competencies to move on to the next level.

The evolution of DNA, the first step in the evolution of living organisms, starting with RNA, took billions of years, but with this information processing backbone, we proceeded to the next step.

It took only 10 million years for the Cambrian explosion to develop all animal body designs, 200 times faster.

And they used that body design to evolve higher cognitive functions, and biological evolution continued to accelerate.

This is an essential property of the evolutionary process.

Homo sapiens was the first species to create technology, combining cognitive abilities with opposable thumbs.

It took hundreds of thousands of years for the human species to evolve, but through interaction, evolution took this technology-producing species to the next level, and that was the first step in technological evolution.

The first steps took tens of thousands of years, stone tools, fire wheels, keep accelerating.

Always use the technology of the previous generation to create the technology of the next generation.

It took a century for typography to spread. The first computers were designed with paper and pen, but now we use computers.

The process continues to accelerate

When you look at this on a linear scale graph, everything seems to have happened suddenly. Some observers say, "Kurzweil just picked points on a straight line and put them on the graph."

So I pulled out a list of 15 important thinkers from the Encyclopædia Britannica Museum of Natural History and Carl Sagan's Cosmic Calendar.

And then it's on a straight line again. There's a little bit of width in the line, but that's because there's a difference of opinion about the key points: when did agriculture start, how long did the Cambrian explosion take?

But there are very clear trends.

The evolutionary process is basically, essentially accelerating.

In information technology, capacity, communication speed, and performance-price ratio are doubling every year.

It's clearly rapid exponential growth.

In my personal experience, when I was at MIT, the computer was the size of this hall, and it had less computing power than a cell phone does today.

Moore's Law is often equated with this exponential growth, but it's actually just one example of many, and it's an intrinsic property of technological evolution.

I plotted 49 famous computers on a logarithmic graph, by the way, the straight line on the logarithmic graph represents exponential growth, which is also exponential.

In 1900, the performance-price ratio for computing was doubling every three years, it doubled every two years, and now it's doubling every year.

This exponential growth spans five paradigms.

Moore's Law, the shrinking number of transistors on integrated circuits, is the last part of that: electromechanical calculators, relay-based computers that cracked the German Enigma code, tube computers in the '50s that predicted Eisenhower's election, individual transistor computers used in the first space flights, and then Moore's Law.

As one paradigm faltered, another emerged to sustain exponential growth.

If you keep making the vacuum tube smaller and smaller, you'll hit a wall.

I can't make it any smaller by keeping the vacuum there at all

A different paradigm of transistors emerges.

In fact, when the limits of one paradigm begin to be seen, there is research pressure to create the next paradigm.

The end of Moore's Law has been predicted for a long time, the first prediction was 2002, and now it's 2022.

Transistors coming in the 2010s will be a few atoms wide and won't shrink any further.

The limits of Moore's Law don't mean the end of the exponential growth of computing power.

Today's chips are flat, but the world we live in is three-dimensional.

We can still use the third dimension. In the last few years, we've made great strides in making that third dimension: self-assembled molecular circuits.

Moore's law will be put into practice before it dies.

The same goes for supercomputers.

So is the processing power of Intel chips, the average price of a transistor was $1 apiece in 1968.

In 2002, you could buy 10 million for the same price.

The consistency of this kind of exponential growth is amazing.

You might think it's the result of a limited experiment, but it's the result of the chaotic behavior of the world as a whole, where nations accuse each other of dumping, IPO company bankruptcies, and marketing campaigns.

It's a very irregular process, but the result is very smooth.

We can't predict how individual molecules in a gas will behave, but thermodynamics can predict the properties of the gas as a whole with great accuracy.

The same is true here: we can't predict any particular project, but we can predict how technology evolves as a result of chaotic and unpredictable competition around the world.

We can predict these trends well into the future.

Like Gertrude Stein said, "A rose is a rose," a transistor cannot be called a transistor.

And by making it smaller, it's cheaper, and electrons travel a shorter distance, faster.

Transistor speeds are increasing exponentially, and the cost per cycle per transistor is halving every 1.1 years.

Combined with other innovations and improvements in processor design, the price/performance ratio is doubling every year.

This is basically deflation 50% deflation

It's not just computers, it's DNA analysis, it's brain scans, it's the web, it's just about anything you can measure -- there's a lot of information-related measures -- performance, penetration, all of those things that double every 12, 13, 15 months.

Performance-price ratio is 40% to 50% deflation

economists are starting to worry about it

We had deflation in the Great Depression, but that's a very different phenomenon, a shrinking money supply, a falling consumer confidence.

This is what's happening with productivity growth, but economists say, "There's no way you can keep up with it forever.

With 50% deflation, people may increase their volume by 30 or 40%, but they still can't keep up."

But what we're actually seeing is more than just keeping up.

Over the past 50 years, information technology has grown at a compound rate of 28 percent.

We wouldn't build an iPod for $10,000 10 years ago.

New applications come to market when price efficiency makes them feasible.

This is a common phenomenon

In the case of magnetic storage, instead of Moore's Law, the increase in recording density is the same exponential process, but by different engineers and different companies.

A key revolution has been the ability of humans to understand how their bodies work in terms of information.

It's made us understand the software that runs our bodies.

We want to change that program because it evolved in a very different time.

This little piece of software called the Fat Insulin Receptor Gene basically says, "Save as many calories as you can for the next hunting season."

This was useful tens of thousands of years ago.

we want to turn off this program

Animal studies in mice have shown that you can eat a lot and still stay slim, which also has the health benefits of being slim.

No Diabetes No Heart Disease Live 20% Longer No Calorie Restriction Reaping the Benefits of Calorie Restriction

Four or five pharmaceutical companies have realized this and see it as a promising drug on the market, just one example out of 30,000 genes that affect the biochemistry of our bodies.

In an era of human evolution, it was not in the interest of the species to see people of age like the participants in this conference living longer, because limited resources would be better allocated to children and those who care for them.

So living longer than 30 wasn't a natural choice, but the biotechnology revolution has taught us how to manipulate and modify that software.

For example, gene silencing can be done by RNA interference.

There's a promising new gene therapy approach that solves the problem of putting genetic material in place on chromosomes.

The first human application is also about to occur: gene therapy for fatal pulmonary hypertension, not just designer babies.

There will be designer baby boomers

This technology is also accelerating, and the cost of DNA sequencing is

In 1990 it was 10 dollars per base pair, in 2000 it was 1 cent.

now less than 0.1 cent

The amount of genetic information is basically growing on a smooth exponential curve, doubling every year, allowing the completion of the Human Genome Project.

Another big revolution is the revolution in communications technology.

Performance-price ratio Communication speed Communication capacity in various scales Both wired and wireless are increasing exponentially

The Internet continues to grow, doubling every year by various metrics.

This is what I see in the number of hosts

The progress of miniaturization technology is also exponential, regardless of whether it is wired or wireless.

This is a design from Eric Drexler's book, but supercomputer simulations have shown it's viability, and there are actually scientists building robots at the molecular scale.

There are robots made out of molecules that walk surprisingly like humans.

Little machines that do all sorts of things are being experimentally built.

Perhaps the most interesting application is going inside the human body for treatment and diagnosis.

It's not as futuristic as it looks

Animal testing is already underway

We have a nanotech device to treat type 1 diabetes.

The size of your blood cells puts it into your body in tens of thousands. They used mice, they released insulin in a controlled manner, and they actually cured type 1 diabetes.

What you're looking at is a robotic red blood cell. Humans are biologically very good, but they're not optimal.

Once you understand the basic mechanics of how things work, reverse engineering of biology is accelerating, and you'll be able to make things like this thousands of times more powerful.

It's a "respirocyte" designed by Rob Fretus, and if you replace 10 percent of your red blood cells with this robot, you can do an Olympic sprint for 15 minutes without a break.

You can sit at the bottom of the pool for four hours, and you can say, "Hey, you're in the pool," and it takes on a whole new meaning.

It will be interesting to see how the Olympic selection goes.

Maybe that kind of thing will be banned, but then there will be a lot of high school students who surpass Olympians.

Fretus also designed a robot white blood cell.

Supposed to be around 2020, this isn't as futuristic as it seems.

We've already had four big conferences on blood cell-sized devices, and a lot of experiments have already been done in animals.

One human clinical trial is planned, so it's a viable technology.

Let's go back to the exponential growth of computing power, where a thousand dollars' worth of computing power is currently between the brain of an insect and the brain of a mouse.

In the 2020s, it will surpass human intelligence in terms of its capabilities, just in terms of hardware.

How do you get the software?

It turns out that we can see inside the human brain. Not surprisingly, the temporal and spatial resolution of brain scans is also doubling every year.

A new generation of scanners is allowing us to see the processing and signals between individual nerve fibers in real time, so the question is, given the data, can we make sense of it?

Douglas Hofstadter said, "Human intellect may not be good enough to understand intellect. If humans are better than it, their brains are more complex and they may not be able to keep up."

but it turned out to be understandable

This block diagram is a model simulation of the human auditory cortex, and it works very well, and in psychoacoustic experiments, it's very close to human hearing.

This is another simulation of the cerebellum. More than half of the neurons in the brain are in the cerebellum, which also works very similarly to human skill development.

It's still early days, but the exponential growth in information about the brain and the exponential improvement in brain scan resolution will allow us to reverse engineer the human brain in the 2020s.

We already have pretty good models and simulations of 15 of the hundreds of regions in the brain.

All of this will drive exponential economic growth.

Over the last 50 years, labor productivity has gone from $30 to $150 per hour.

E-commerce has grown exponentially and is now a trillion dollars.

You might think that there will be ups and downs

It's a phenomenon limited to financial markets.

Wall Street realized that this was a revolutionary technology, and it was, but after six months, they decided that they had made a mistake because they hadn't seen a revolution in their business models.

This is a compilation of the technologies we're involved with.

Eventually, it will become a commonplace feature on mobile phones.

You can translate from one language to another

I'll end with two scenarios.

Computers will disappear by 2010.

They become smaller and become embedded in clothing and the environment.

Images are drawn directly onto the retina, providing fully immersive virtual or augmented reality, allowing us to interact through a virtual persona.

In 2029, when this trend has matured, you'll appreciate generations of technological advancements, faster speeds, and performance-price ratios.

Ability The communication speed will be 2 to the 25th power, which is amazing.

Be a million times stronger than today

The human brain has been reverse-engineered, and a thousand-dollar computer will far surpass the human brain in terms of basic capabilities.

Computers will combine our ability to recognize patterns with our already superior analytical skills and ability to accurately remember billions of facts.

Machines can quickly share knowledge

This isn't some kind of invasion by intelligent machines.

We're going to merge with technology ourselves.

Nanobots will first be used in medicine, followed by environmental uses such as environmental cleanup, powerful fuel cells, and widely distributed solar panels.

It's even incorporated into the human brain, where it communicates with nerves.

The basic methods that make it possible are already in place.

For example, in fully immersive virtual reality embedded in your nervous system, nanobots block the signals coming from your sensory organs and instead send them the signals that you would receive if you were in a virtual environment, and you feel like you're in a virtual environment.

You can go there with other people and you can have all kinds of experiences with all your senses.

An "experience projector," as I like to call it, will be able to put the whole neurosensory experience, with its emotions, on the Internet.

You can connect with it and experience what it's like to be someone else.

But most importantly, the convergence of technology will greatly expand human intelligence, and to some extent this is already happening.

Every day, we accomplish intellectual feats that would not have been possible without technology.

Human life expectancy is increasing. In 1800, we were 37 years old. And with the revolution in biotechnology and nanotechnology, life expectancy will also increase rapidly in the future.

My message is that technology advances exponentially, not at a constant rate.

Many people, including scientists, assume the constant velocity model that self-replicating nanotech machines and artificial intelligence are hundreds of years away.

If you think about the power of exponential growth, you'll find that you'll get those things much sooner.

Information technology is increasingly embracing our entire lives, from music to manufacturing to biology to energy to matter.

By the 2020s, we will be able to use information, cheap raw materials and nanotechnology to make almost anything we need.

very powerful technology

Increased possibilities and risks

must be willing to apply it to the right problem

thank you

(applause)

when you're working out

It feels easy at first, but then it gets harder and harder until you can't lift it.

On the inside of the arm, the muscles that lift things are no longer able to contract.

Why do muscles get tired?

Lactic acid and exhaustion are often attributed to this, but these are not the only causes of muscle fatigue.

Another major factor is the muscle's ability to respond to signals from the brain.

To understand the root cause of muscle fatigue, we need to understand how muscles contract in response to signals from nerves.

These signals travel from the brain to the muscles in a fraction of a second through long, thin cells called motor neurons.

Between motor neurons and muscle cells there is a very small gap, and the exchange of particles through this gap enables muscle contraction.

On one side of the gap is a motor neuron that contains a neurotransmitter called acetylcholine.

On the other side are charged particles, or ions, with potassium on the inside and sodium on the outside, lined up along the muscle cell membrane.

In response to signals from the brain, motor neurons release acetylcholine, causing pores in the muscle cell membrane to open.

Sodium goes in, potassium goes out.

The flow of these charged particles is very important in muscle contraction, and changes in the amount of charge generate electrical signals called action potentials throughout the muscle cells, stimulating the release of calcium stored within them.

This flow of calcium results in muscle contraction. Proteins embedded in the muscle fibers bind to the muscle fibers, pulling them together and locking them together, causing contraction.

The energy required for muscle contraction comes from a molecule called ATP.

ATP also later moves ions back through the muscle cell membrane, restoring the balance of both sodium and potassium.

This whole process repeats itself each time a muscle contraction occurs.

As each contraction uses up energy in the form of ATP, waste products such as lactic acid are produced, and some ions flow out of the muscle cell membrane, leaving smaller clumps of ions behind.

Muscle cells use up ATP with each contraction, but they're constantly making more ATP, so even severe muscle fatigue usually doesn't use up this energy.

What's more, most waste products are acidic, and the pH of tired muscles is within the normal range, indicating that the tissue of muscle cells is effectively removing waste products.

As muscle contractions are repeated, the concentrations of potassium, sodium, and calcium ions eventually decrease, and soon the amount obtained from the surroundings becomes insufficient to return the system to its proper state.

So even if the brain sends a signal, the muscle cells can't generate the action potentials needed to contract.

But even when ions like sodium, potassium, and calcium are depleted in and around muscle cells, these ions are abundant elsewhere in the body.

In a short amount of time, they're back where they're needed, sometimes with the help of brisk sodium and potassium pumps.

So when you stop moving and take a break, you replenish your muscles with ions and relieve muscle fatigue.

The more regularly you exercise, the longer it takes for your muscles to fatigue each time.

Because the stronger you are, the fewer repetitions your brain sends nerve signals to contract your muscles when you lift a certain weight.

Fewer cycles mean slower depletion of ions, so the more robust your body is, the longer you can exercise at the same intensity.

Many muscles are developed through exercise, and larger muscles can store more ATP and have a greater ability to remove waste products, delaying fatigue much later.

In the 17th century, the Dutch East India Company chartered hundreds of ships to trade gold, pottery, spices and silk around the world.

But the cost of large-scale operations didn't come cheap.

In order to finance the high cost of operations, the company turned to the general public to invest the money needed to run the voyage, and split the profits in return.

In this way, the company was able to embark on a much bigger voyage, yielding more profits for both the company and its smart investors.

By selling quotas at coffee houses and shipping ports in various parts of the continent, the Dutch East India Company inadvertently invented the world's first stock market.

Since then, many companies have raised money from investors backing various businesses.

And now the stock market has schools and even specialist TV channels to expand its understanding.

But the modern stock market is much more complex than it was in its original form.

So how are companies and investors using the market today?

Imagine starting a new coffee company in the market.

First, the company advertises to large investors.

If they like this company, they get the first opportunity to invest in the company's first public offering, an IPO.

The company is now publicly traded, and companies and individuals who believe they can profit from this business may buy shares.

By buying a stock, the investor becomes a partial owner of the business.

As the investment grows the company and the company becomes more successful, more buyers may see the future and start buying the stock.

As demand for these stocks rises, so does the price of the stock, the asking price for future buyers, and the value of the stock for those who already own stock in the company.

For a company, increased public interest makes it easier to fund new projects, and it also boosts market value by showing that more people are willing to invest in this idea.

But if for any number of reasons the company doesn't seem to be profitable enough, the opposite can happen.

If an investor thinks the price of the stock they own will go down, they sell the stock to make a profit before the company's value falls further.

As stocks are sold and demand for those stocks declines, the price of the stock goes down, and the market price of the company goes down with it.

Investors could suffer big losses if the company doesn't start to look profitable again.

This fluctuation in demand and supply is influenced by many factors.

Companies are subject to inevitable market forces, such as fluctuating material prices, changes in production technology, and fluctuations in labor costs.

Investors may worry about leadership changes, bad publicity, or bigger factors like new laws or trade policies.

Of course, many investors simply sell overpriced stocks for personal gain.

All these volatility factors add noise to the stock price movement on a daily basis, making the company appear more or less successful.

When the stock market looks like prices are going down, it often loses investors and the actual price goes down as a result.

People's trust in markets can lead to everything from booms to financial crises.

And it's this elusive factor that's why most experts encourage reliable, long-term investments over short-term money.

But experts are constantly inventing new ways to increase their odds of success in this highly unpredictable market.

But the stock market isn't just for the rich and powerful.

With the advent of the Internet, ordinary investors can buy stocks in much the same way large investors do.

By educating themselves about this complex market, more people will be able to trade stocks themselves, support the companies they trust, and pursue their own financial goals.

The first step is to invest

What if you had a very obvious problem in front of you?

It's an issue that everyone talks about and that directly affects them.

Will you do your best to deal with the problem before it gets worse?

not necessarily

We all tend to overlook what's in front of us more than we admit to ourselves.

In fact, it's precisely because it threatens our jobs, our lives, our world that we tend to turn away.

Let me give you an example from my area of ​​expertise, economic policy.

When Alan Greenspan was Chairman of the Federal Reserve, his job was to keep an eye on problems in the American economy and keep them from spiraling out of control.

At the peak of real estate prices in 2006, a growing number of respected leaders and organizations began sounding the alarm about risky lending and dangerous market bubbles.

As you know, in 2008 everything fell apart.

Banks collapsed, global stock markets fell by nearly half, and many people lost their homes because they couldn't pay their debts.

At its worst, one in ten Americans was unemployed.

When things calmed down, Greenspan and many others did postmortems and said, "No one could have predicted this crisis."

they called it the "black swan"

It means something that cannot be imagined or predicted, something that is highly unlikely to happen.

It was a complete surprise—

Except that it wasn't really that surprising.

For example, my apartment in Manhattan nearly doubled in price in four years.

I saw a bad omen and sold it.

(Fist pump) (Applause) Many other people noticed the bad omens and complained to people, but were ignored.

I didn't know the details of exactly what that crisis would look like, but I did know that something dangerous, visible, and predictable was looming, like a charging big gray rhinoceros.

The black swan view leads to the idea that we have no control over the future.

The more powerless we feel about something, the more we underestimate or turn a blind eye to it.

This dangerous reaction hides another problem: many of the problems we face are obvious and likely to happen, and we see them, but we don't do anything about them.

So I created a metaphor called the "gray rhinoceros" for anything that feels like it needs an urgent response.

So that I can take a fresh look at the problem with the same zeal that I have for black swans, but in this case it's a problem so obvious and so likely to happen that it's been ignored.

that's the gray rhino

When you start looking for gray rhinos, you start noticing them in the daily news.

What I see in the headlines is another big gray rhino, another likely financial crisis.

I wonder if we've learned anything in the last 10 years.

You'd be forgiven for thinking that if you're listening to the U.S. government and the financial district, things will be smooth sailing.

But in China, where I spend most of my time, the tone is quite different.

The entire economic team, led by President Xi Jinping, has been very specific and clear about the financial crisis as a gray rhino and how to deal with it.

Of course, China and the United States have very different government structures, and there are differences in what they can and can't do.

Many of the root causes of economic problems are also quite different.

But it's no secret that both countries have budget deficits, inequality, and economic productivity problems.

So why is the tone so different?

This question isn't just national, it's almost universal.

Some auto companies put safety first, while others wait until a fatal accident has occurred to recall a defective vehicle.

Some of the elderly have written their obituaries and even set menus for their funeral lunches in case they ever come.

(Laughter) My grandparents were.

(Laughter) And they had the gravestones engraved with everything but the year of death.

On the other hand, some people leave the junk they've been accumulating for decades without putting it in order at the end, and let their children deal with it.

What is the difference between the two?

Why do some people see the problem and deal with it, while others look away?

One has to do with the culture, the society, the people that surround the person.

If you have someone nearby to help you when you fall, you will feel less dangerous.

And not just the bad, but the good opportunities as well.

For example, if you talk about dangers that no one wants to talk about, you run the risk of being criticized.

Or you can bet on an opportunity that scares you, and it's kind of a "gray rhinoceros."

In America, we have a strong individualistic culture, and we try to do it alone.

Paradoxically, this makes many Americans reluctant to embrace change and take positive risks.

In China, by contrast, people believe that the government will forestall problems, not necessarily, but they do.

I also believe that I can rely on my family, which makes it easier for me to take certain risks.

Whether it's buying real estate in Beijing, for example, or accepting the fact that you need to turn around -- the pace of change in China is truly staggering.

Second, there's the difference in how aware you are of the situation and how willing you are to learn.

Even if you want to turn your eyes away, are you willing to turn your eyes properly?

Most people don't pay attention to what they don't like, what they want gone. We pay attention to what we want to see, what we like, what we agree with.

We have the opportunity and the ability to correct such blind spots.

I talk to people from all walks of life and hear about their gray rhinoceros and their attitudes towards it.

You might think that risk-averse people, risk-sensitive people, are less willing to embrace change.

But it's actually the other way around

We've found that people who are willing to look at the problems around them and make plans are more willing to take good risks and deal with bad ones.

Because seeking information gives us more power to deal with our fears.

that brings us to the third point

It's how much control you feel you have over the gray rhino in your life.

One of the reasons we don't take action is because we feel powerless.

Think climate change. It's such a big problem that none of us are likely to make a difference.

So some people just deny it

Some people blame everyone but themselves

I have a friend who says he's not going to let go of SUVs until China does away with coal power.

But we have a chance to make a difference

no two people are the same

We have an opportunity to change our attitudes and those around us.

So I'm going to ask you to join us today, and start an open and honest conversation with those around you about the gray rhinoceros out there, and tell us how you're going to deal with it.

In America, we often hear, "Obviously, we should deal with it, and if you don't see what's in front of you, you're either stupid or ignorant."

I totally disagree with this

If you don't see what's in front of you, it's not because you're stupid or ignorant, it's because you're human.

If we all recognize our human weaknesses, we will have the strength to open our eyes, see what's in front of us, and act before the rhinos trample us down.

(applause)

When I look in the mirror now, I see a student of justice and education at Columbia University, a youth mentor, an activist, and a future New York state senator.

(Cheers) Yes, each of them looks like me, but I also see a man who spent a quarter of his life in a state prison. Six years, to be exact. I almost let a man die.

From there to here, it wasn't the punishment I experienced as a teenager in an adult prison or the harshness of the justice system that got me out.

In fact, it was the classroom that gave me the environment to learn, and that's where I discovered what I thought was impossible for me, and for the entire legal system.

A few weeks before I was released on parole, a counselor encouraged me to take a new college course while in prison.

The course was titled "The State of the Criminal Justice System".

Sounds like a boring subject, doesn't it?

When I went there, the class consisted of eight inmates and eight assistant prosecutors.

Geraldine Downey, a professor of psychology at Columbia University, and Lucy Lang, an assistant Manhattan prosecutor, jointly lectured for the first time.

To be frank, it was a much different start to my college life than I had imagined.

Shocked from day one

I assumed that all the prosecutors in the classroom were white.

I remember walking into the classroom on the first day of class and seeing three black prosecutors, and thinking, "Wow, black prosecutors - are they out there!"

(Laughter) By the end of the first lecture, I was completely mesmerized.

And a few weeks after I got out, I was doing something I swore I would never do.

I went back to jail

Fortunately, at that time, my goal was to be a student and take classes with my peers.

And that time, I could go home after school.

In the second lecture, we talked about how each of us came to take the class in our own capacity.

I've finally come to the point where I want to open up and tell everyone in the classroom the facts that have led me to this point.

I told him how my siblings and I had witnessed my father-in-law abusing my mother for years, and that it ended up in an institution.

I vowed to protect my family

I even talked about how, at 13, I felt more like a soldier in charge than a teenager.

Like all soldiers, that responsibility weighed heavily on me, and I hate to say it, but I had a gun on my hip.

Just a few days after my 17th birthday, I completely failed in my duty.

I was walking with my sister to the laundromat when a group of people stood in front of me.

Two girls suddenly appeared and punched my sister.

Confused by the events before me, I tried to pull one of them away, and at the same time I felt something scratch my face.

I was so excited that I didn't notice a man jump out of the crowd and cut me.

I felt the warm blood running down my face, and when I saw him turn to me again and raise his knife, I grabbed the gun on his hip and pulled the trigger to defend myself.

Luckily, the man survived that day.

Feeling my hands trembling and my heart pounding, I was paralyzed with fear.

The regret I felt in that moment will haunt me for the rest of my life

I later found out that my sister had been mistaken for someone else.

It was a terrifying experience, but one thing that became clear to me was that I lacked the training and the qualifications to be a soldier.

But in my area, I didn't feel safe without a weapon.

Now, the prosecutor who heard me in the classroom knew that I did not intentionally cause harm.

I just wanted to get home safely

I could see how the prosecutor's face literally changed as the stories of other prisoners were told.

It's a story about many people falling into a vicious cycle of imprisonment, a vicious cycle that most prisoners never get out of.

Of course, some people commit terrible sins.

But the pre-criminal life history of such criminals was unlike anything the prosecutor in the classroom had ever heard of.

And when it was the prosecutors' turn to speak, I was shocked.

They weren't mindless drones and robocops programmed to imprison criminals.

They too were sons and daughters, brothers and sisters.

And above all, they were all excellent students.

full of ambition and energy

I believed that I could use the power of law to protect people.

Everyone was burning with that responsibility that I could sympathize with.

In the middle of that class, a student named Nick, a fellow inmate, voiced his concern that the issue of racism and prejudice in the criminal justice system is not properly addressed by prosecutors.

As any prisoner should know, we can't talk about reforming the justice system without discussing race.

So as we all cheered Nick in our hearts, we listened with great interest to see what the prosecutor would say.

I honestly don't remember who spoke first, but when a veteran prosecutor named Chauncey Parker agreed with Nick and said he was committed to ending the mass incarceration of people of color, I believed him.

I'm sure you're on the right track

From that moment on, we started working together.

While exploring what the judicial system can do in the future, we've begun looking at concrete steps to uncover the reality of the judicial system and make real change for us.

For me, it's not a forced program in prison.

Hearing the Elders' Counsel - It was an opportunity to hear the advice of those sentenced to life imprisonment.

They changed the way I thought about being human.

They listened to all their wishes and goals, hoping that I would never go back to prison and be their voice in the outside world.

Hearing my story, one of the prosecutors was taken aback and said something that seemed normal to me, "You grew up in spite of your time in prison, you didn't grow because of your time in prison."

It was clear that prosecutors didn't really think about what would happen to the defendant after he won a conviction.

But through the simple act of attending a lecture together, they began to understand that keeping criminals in prison would never help the community or us inmates.

Towards the end of the lecture schedule, the prosecutor's eyes lit up when he heard about our plans after we got out of prison, but how hard life really was.

I didn't know what was waiting

The young assistant prosecutor was shocked to learn of the existence of an object, a temporary identity card that was given in exchange for freedom, and which could tell at a glance that its owner had just been released from prison.

She had never thought of how many obstacles this would pose to her reintegration efforts.

And yet, he truly sympathized with having to choose between a bed in a shelter and a sofa in a relative's cramped apartment.

What was learned in the lectures was refined into concrete policy recommendations.

We presented the proposal to the Director of the State Department of Corrections and the Manhattan District Attorney during our commencement ceremony in a packed auditorium at Columbia University.

It was the perfect way to cap off the eight weeks we spent together as a team.

Exactly 10 months after I got out of prison, I found myself in a strange room again, when I was invited by the New York City Police Commissioner to give my opinion at the Police Summit.

As I was speaking, I saw a familiar face in the audience.

was the prosecutor who prosecuted me

Seeing him reminded me of when he was tried seven years ago, where the prosecutor sought a lengthy prison sentence, where my adolescence was treated as meaningless and without any potential.

But this time things were different

I brushed aside the past events in my mind, and I approached him and asked for a handshake.

he was happy to see me

I was surprised and happy

He told me that he was proud to have met me in that room, and he told me that we should work together to improve the situation in our society.

I'm now using all of these experiences to help found the Justice Ambassadors Youth Council at Columbia University, which is made up of young New Yorkers, both inmates and current high school students, and city officials.

And in that classroom, we're going to bring together ideas to improve the lives of the most vulnerable young people in our city, so that they don't end up on trial in the criminal justice system.

You can do it

Our society and judicial system make people believe that nasty things can be contained and that problems in society can be solved through punishment.

but the reality is different

Think about it for a second. What if, in the future, whether you're a prosecutor or a judge or a police officer or a probation officer, you'll have to first learn from, interact with, and gain insight from those whose destinies depend on your decisions?

I'm working to raise awareness of the power of dialogue and the need for collaboration.

If we seek justice, education is the way to reach justice that inclusive and unites people.

For me, new forms of dialogue and new forms of learning environments have taught me how to change both the way I think and the existing criminal justice system.

They say the truth will set you free

But I believe that what sets people free is learning and interacting.

thank you

(applause)

When I first arrived in beautiful Zimbabwe, it was difficult to comprehend that 35 percent of the country's population is HIV positive.

It wasn't until I was invited into people's homes that I began to understand the suffering people were suffering from the pandemic.

For example, Herbert who lives with his grandmother

When I first met him, he was sitting on his grandmother's lap.

Both of his parents died of AIDS, and he was cared for by his grandmother, who also died of AIDS.

He liked to sit on his grandmother's lap because it hurt so much to lie on the bed.

I put him in my lap as my grandmother got up to make tea, and I had never held a child so emaciated.

Before leaving, I asked him if he should bring something with him on his next visit.

I expected him to ask for toys or sweets, but he wanted slippers because his feet were cold.

Joyce in this photo when she was 21

I was a single mother and HIV positive.

I photographed her before and after giving birth to her beautiful baby Isa.

Last week, I was walking down Lafayette Street in Manhattan when I got a phone call from a woman I didn't know who told me that Joyce had passed away at the age of 23.

Like many other children in Zimbabwe who were orphaned by the AIDS pandemic, Joyce's mother is now raising her grandchildren.

So examples like this are not uncommon.

But every photo shows people with full lives and stories worth telling.

This photo was taken in Zimbabwe

Chris Anderson: Christine, for a moment, can you tell us how you came to go to Africa?

Christine Ashburn: Hmm.

CA: Just a little bit KA: Actually, I was doing fashion photography at the time.

I used to read the New York Times all the time, but one day the statistics, the numbers, took my breath away.

I just got scared

So I quit my job and decided that this was the topic I really wanted to work on.

And then I actually went to Botswana and spent a month there -- this was in December of 2000 -- then I spent a month and a half in Zimbabwe, and then in March of this year, 2002, I went back to Zimbabwe and spent another month and a half there.

CA: Great story. thank you.

KA: Thank you very much.

A rabbit tries to play the church organ A knight fights a giant snail while a naked man blows a trumpet with his buttocks

Painted with squirrel-hair brushes on vellum and parchment by monks, nuns and town craftsmen, these whimsical drawings fill the margins of some of the most precious books of the Middle Ages.

These illustrations tell different stories as richly as the text.

Illustrations appear in various illuminated manuscripts, further emphasizing the religious content of the illuminated books.

For example, a hedgehog trying to pick a fruit with its own quills could be a symbol of the devil stealing the "fruit of faith," or it could be Christ atoning for the sins of mankind.

According to medieval legend, a unicorn can only be caught by a hunter when it rests its horn on the lap of a virgin, so the unicorn may symbolize sexual seduction or Christ's capture by his enemies.

Rabbits, on the other hand, may represent human sexuality and, despite their flaws, try to clear their stigma by trying to make sacred music.

All of these quotes would have been well-known in medieval Europe in other arts and folklore, and some have become even more mysterious over the centuries.

Now, no one can really explain what the mundane motif of a knight fighting a snail means, or why a knight is always on the verge of losing.

The fact that a snail can defeat even the strongest of knights may be a symbol of the inevitability of death.

Or maybe it expresses humility and the knight's need to keep his self-esteem in check.

Many of the illuminated manuscripts were copies of religious or classical texts, and the bookbinders incorporated their own ideas and opinions into the illustrations.

For example, the butt tuba is probably a shorthand for the text's criticism of behavior and a twist of irony.

Illustrations can also be used for aggressive political commentary.

The texts of the Smithfield Papal Statutes detail canon law and punishments for those who break the law.

But in the margins, there's a picture of a fox being hanged by a goose, alluding to a civil rebellion against powerful authorities.

In The Grand Chronicle, Matthew Paris summed up the scandal of the time by describing the death of Prince Griffin of Wales, who fell from the Tower of London.

Some believed that the prince had fallen, as Paris wrote, while others thought he had been pushed down.

He uses his own thoughts in the margins to depict the prince falling as he tries to escape with a rope he's made from his bed sheets.

In some of the margins, I put stories with more personal content.

Lord Luttrell's Psalms, a book of verses and prayers commissioned by Sir Geoffrey Luttrell, depicts a young woman straightening her hair while a young man catches birds with a net.

The fact that hair is beginning to grow in areas of shaved baldness suggests that he is a clergyman who has abandoned his duties.

This alludes to a family scandal - a young clergyman eloping with Jeffrey's daughter Elizabeth.

It was probably drawn into the book by the family's spiritual mentor, reminding the client of his shortcomings and encouraging him to grow spiritually.

Some artists even describe themselves in manuscripts.

Christine de Pizan presents a book to the Queen of France in the painting that graces the opening pages of her collection of works.

The Queen was so moved by de Pisan's previous work that she commissioned a book for herself.

With that kind of royal support, de Pisan was able to set up a publishing house in Paris.

The tradition of illuminated manuscripts lasted more than 1,000 years.

Books were produced by individuals and organizations for a variety of purposes: personal prayer books, prayer books for churches, textbooks, and talismans to carry on the battlefield.

What the various manuscripts have in common is that the small, subtle drawings in the margins are unique windows into the mind of the medieval painter.

For the first time in modern American history, five generations are engaging in the workplace.

The veteran generation, born between 1922 and 1943, is known as the "Great Generation," the Mature Generation, or the Silent Generation.

Known for self-sacrifice, they respect authority and see work as a reward.

Baby boomers were born soon after, between 1944 and 1960.

Characterized by diligence

So much so that the term "workaholic" came from this generation.

Encourage competition and value effective communication

If you haven't retired yet, this is the generation that is thinking about retirement.

Generation X, also known as the Lost Generation or Keychain Generation, are people born between 1961 and 1980.

It's the smallest generation, sandwiched between the baby boomers and the larger millennials.

It's also the generation whose parents divorced in more families than any previous generation.

They're the generation that coined the idea of ​​work-life balance, and the first generation that actually demanded it in the workplace.

And millennials, the generation that everyone got awards for, were born between 1981 and 2000.

It's a generation that doesn't know a time when technology didn't exist in the home.

very down-to-earth, hopeful and strong-willed

I think we're going to change the world, and I honestly think that's true.

It may be a little idealistic, but in just a few short years, millennials have surpassed Generation X to become the largest generation in the workplace.

In fact, more than a third of the American workforce are millennials.

And soon to join Generation Z, the generation born after the year 2000 who are interns in high school and who are about to graduate from high school.

Now, open up your browser, go to Amazon, or search with your favorite search engine. You might think that the modern workplace is a battlefield.

I see blogs with titles like, "17 Reasons Why Millennials Are the Worst."

“Did Baby Boomers Ruin the World?”

"How to solve the big divide between generations" etc.

It's like West Side Story, baby boomers come out this door, millennials come out that door, out the lobby, fight all day, complain, go home, and come back to work.

But what if generations might not actually exist in the first place?

I've been thinking and working on this subject for some time, but I and others don't believe that generations really exist.

Moreover, even if we could acknowledge the existence of generations, there would certainly be disagreements about who should be in which generation.

Even within the same generation, there is a gap of 20 years or so.

At any given moment in history, it's impossible for a 1-year-old and a 20-year-old to share a common set of values, want the same things in their careers, and apply the same stereotypes regardless of their circumstances.

In fact, different regions of the world define generation differently.

So you can't even compare generations from different regions.

And all too often, preconceived notions about generations come true. People start acting like they're part of each generation, because generations have been so loudly said to be real.

but i'm not sure

This idea of ​​"generation" is deeply ingrained in American culture.

Everyone knows exactly what they're talking about when they talk about "generation."

In fact, there are many thoughts and feelings about each generation.

There are grounds for saying that

Because when a question arose, I did what any motivated young American researcher would do: a Google search.

and found that

Google is an algorithm that displays popular terms and predictive search results based on what other people are searching for on the same topic.

It gave me a great sense of what people think of each generation.

Please look

Americans think baby boomers are conservative, stupid, and the worst generation.

They're angry and racist, and they're the people they care about.

I've learned that Generation X is a bunch of cynics, irreverent and, as I said earlier, the least populated generation known as the Lost Generation.

This generation is so stupid

(Laughter) And most of the people get annoyed with the baby boomers.

Now, what about millennials?

I am preoccupied with food

(Laughs) After all, "idiot" came out!

They're lazy, they're sensitive, they're fired, they're hated, they think they're important.

And perhaps the most terrifying of all the search results is this: Generation Z has a dark future.

(Laughter) Over the last five years, I've been talking to both managers and subordinates at a wide variety of companies.

and then I realized

"Generation" in the workplace is no longer part of the conversation, it's now the conversation itself.

And that means everyone is working under the assumption that Google's search results are correct.

So I think companies are now desperately trying to figure out how to manage a multigenerational workplace.

is "management"

we want to manage everything

We're trying to prepare for the millennial wave that's coming into society.

Be prepared for a hurricane

I understand the entrance exams for medical colleges and how to prepare for natural disasters.

Why do you think about measures for 23-year-old new members of society?

(Laughter) In my interviews with companies, I've heard stories of wonderful initiatives. Some companies are trying to create workplaces where everyone feels connected, autonomous, and successful.

On the other hand, some companies had outrageous ideas about how to navigate a multigenerational workplace.

Are you ready?

It's like this

I visited a company, and they were embracing the "if you can visualize it, you can do it" mentality.

very important concept

But it was also ruined

I had pictures of my ideal multigenerational workplace hanging on my wall, and they said, "If you can visualize it, you can do it."

(Laughter) And there were pictures like this.

(Laughter) I don't want to work in a place like this.

(Laughter) Looks like colored clothes aren't allowed here, and HR would have trouble with people jumping in heels, no doubt.

A company I spoke with recently came close to installing ball pits in their break rooms as a way to keep millennials from leaving.

we're 30, not 3

(Laughter) And there's more. A millennial woman I know has been told that if you want to be taken seriously, if you're a millennial, you have to wear this: shoulder pads.

That's right

They told me that unless I wore shoulder pads, neither the younger nor the older would listen to me seriously.

It's a shoulder pad from the 80's that isn't even sold anywhere.

This young woman had two master's degrees.

it's me

Is this the best course of action?

To steer a multigenerational workplace... shoulder pads?

(Laughter) One more thing that I learned from talking to companies that employ people of all ages.

We have much more in common than we have differences.

It's a story I hear very often

People want meaningful work, flexible ways of working, support at work, recognition, and good coffee.

none of it is related to generation

Sure, there's a little difference in what each wants.

20-year-olds and 60-year-olds do different things when they go home.

have different values

At least that's what happens in the realm outside of work.

But at the moment, the workplace is so focused on the collective characteristics of each generation that it forgets the fact that we are all human.

To find out who your co-workers really are and who they are, you have to find a better way to navigate the multigenerational workplace, better than a ball pit.

It might sound like an idealistic millennial mindset, but it can be done.

I don't think it's terribly difficult.

Let's see the other person as they are

individualize the approach

The opponent is not a "generation" but a person

A lot of the people I've talked to have said they feel like they relate to a certain generation.

There are 80-year-olds who text and 23-year-olds who crochet.

Both are far from the stereotypes of each generation.

Innovation leader Nilofer Merchant says that you have to understand the uniqueness of the other person, that is, their unique place in the world, which is shaped by their unique backgrounds, experiences and aspirations.

But understanding requires flexibility and curiosity.

If you can understand someone's uniqueness, or their position, then you can understand that, for example, baby boomers who always act like they're angry at work are just anxious.

Because he's been working every day since he was 16, and one day early in the week, he's going to retire sooner than he could have imagined.

I have plans after retirement

In ten days or so, you'll do everything you want to do on that list.

But after that?

So why don't you be kind to me, maybe I'm just worried about the future

Or someone from Generation X, who has three kids and has four or two stops, trying to make ends meet for the family.

You may not be very friendly at work

Maybe you don't like crowds, maybe you're tired

And millennials, I don't know who they are, but they're asking for a raise in two months.

Maybe it's just that this generation has more debt to get out of college than any generation before them, and they just need money to survive and pay their rent.

If you can understand the uniqueness of the other person in this way, if you can understand the position that only that person holds, without being bound by the concept of generation

It's about individuals like "Jim" and "Jen."

let's do one task

Choose one person from the surroundings and search for that person's uniqueness

let's find out

And choose the right time to tell the other person

Find something that only you can do, not anyone else, because that enriches your work.

repeat it

I repeat

And I realized that work is not about generational relations,

become a person-to-person relationship

The only way to truly understand the wonders of the multigenerational workplace is to see people for what they are.

You don't have to start living with your partner

But sometimes it might seem nice to put yourself in someone else's shoes.

So there's no need to argue about which generation is the most angry, or the most ignorant, or the most food-obsessed.

We all come to class and work and come home, tired and sometimes exhausted.

Let's try to be humble and see the other person for what they are, what they are like that day, regardless of generation.

If it feels like there's a war going on between generations, at least we can all agree that shoulder pads are not the solution.

(laughs) Thank you very much.

(applause)

(instructs Bailey in English) Hello everyone.

I'm Yuko Morita

This is Bailey, the facility dog.

Ladies and gentlemen, when you were a kid, weren't you afraid of injections?

Immunization at school — Didn't you ask the child who finished earlier, "Did it hurt? Did it hurt?" Injections and blood draws are very scary for children.

Children in the hospital have their blood drawn over and over again.

Some children need a test called a bone marrow aspiration, in which a large needle is inserted into the lower back bone.

Bailey here -- I'd like to do 100 more tests like that with Bailey.

I have the power to make children say

Japanese medical care is said to be of the highest standard in the world, but that's when it comes to treating illnesses.

In Japan, where perseverance has been considered a virtue, it is said that there is little support for improving the quality of hospital life.

I used to be a nurse at a children's hospital in Tokyo.

One day, the mother of a child in the hospital told me, "This is like a prison."

I thought I was doing my best to think about my children, so I was really shocked when I was told that.

But the fact is, kids in the hospital can't even go for walks -

Don't bring your favorite food —

I don't have much fun

Some children stop smiling

Now that I think about it, maybe I should have been told that it was a prison.

That's when I was invited to work as a facility dog ​​handler by a non-profit organization that I'm currently working for, called Shine On Kids.

Childhood cancer in Japan We are an NPO that supports the families of children with intractable diseases.

At that time, I heard that it was a job to take a dog to a children's hospital and work as a member of the medical staff.

But if there were dogs in this ward, how much fun would it be for the children who were called prisons? I was so excited

Without hesitation, I said, "I'll do it!"

There is no facility dog ​​training center in Japan.

Both Bailey and I were trained at a training center in Hawaii.

I also practiced following a senior facility dog ​​at a children's hospital in Hawaii.

And that facility dog ​​even went into the ICU ward, where critically ill patients are treated intensively.

There was this kid who had just had half of his hair shaved off and had a big scar on his head, just after surgery.

I frowned painfully

Despite my worry, "Is it okay for me to go in such a difficult time?", the facility dog ​​got on the child's bed with tubes all over his body and started sleeping with him.

Then the child's expression softened.

It should be hard to move, but I hugged the dog and closed my eyes.

I felt really relieved

When I saw that, I thought, "Wow!" I thought, "I can put a smile on the face of the hospital, too," so I brought Bailey back to Japan.

Until then, there were no facility dogs in Japan.

The sense of dogs is different in Europe and the United States than in Japan.

In Europe and the United States, it was a common culture to keep a dog in the house as a member of the family.

But Japan has a history of keeping dogs outside.

"How can you put a dog in a hospital?" was the feeling in Japanese hospitals.

Until then, there were dogs in Japan who occasionally volunteered to visit hospitals.

But I didn't have the feeling of having a dog in the hospital every day, thinking of the dog as part of the medical staff.

"It was like this in Hawaii" doesn't work at all in Japan.

We desperately searched for a hospital that would accept Bailey.

Shizuoka Children's Hospital finally accepted me.

But when I actually started working, I was like, "Isn't a dog-type robot okay?"

In the beginning, there was only one ward to put in.

So the day's work is over in minutes

An hour after arriving at work, I'm already out of the office.

All I could think about was, "Can facility dogs be accepted in Japan?"

But the kids wanted Bailey.

Now, five years later, we're getting into most wards.

Doctors and nurses began to realize that Bailey was making a positive difference for children and families.

One blind child used to scream in panic whenever blood was drawn.

Bailey was next to me, and I could pat him on the head and draw blood, and I didn't cry.

After the surgery, the child who was in pain and couldn't move got up with a jerk to meet Bailey.

surprised the doctor

A family suddenly being told, "Your child has cancer," — families are more stubborn in front of their children because they're afraid of them.

But if you keep suppressing your feelings all the time, you'll reach your limit someday.

It's important to cry

When the other person is human, I think, "I have to say something."

But Bailey doesn't need to be forced to speak.

One mother hugged Bailey in the hallway, cried her heart out, and walked back to her child with a clean face.

Bailey had a big effect on my family, too.

I realized that there are three important bonds for facility dogs.

Bailey and the Children Bailey and the Handler Bailey and the Medical Staff

These three bonds

The first bond is -- Bailey works at the same hospital every day, so he sees the same kids over and over again.

For children, it's not just about having a dog.

It's good because Bailey comes every day.

Because it's Bailey who's bound by bonds, I think, "Let's do our best."

Most kids who initially hated dogs will love Bailey.

To children, Bailey is a companion with a tail to fight with.

Bailey can even walk with the child to the operating room.

Even adults are afraid to undergo surgery, aren't they?

From the hospital ward to the operating room, it's a scary time for children.

But when I take Bailey's leash and walk with him, he says, "This way," and guides Bailey as he walks away with a smile.

The walk to the operating room is the time when you can have everyone's Bailey to yourself.

Some children play with Bailey's fluffy tail like a cat while walking.

Some children smile happily, saying, "I'm telling you to do your best with your tail."

In this way, my fear turns into joy and I make my way to the operating room.

The second bond, facility dogs and handlers live together 24 hours a day.

We are always together on holidays

This is important, it's not good to be together only at work and say "Bye-bye" when the work is over.

Bailey and I sleep together under our arms at night.

The bond between facility dogs and handlers — this is the foundation on which facility dogs work

Because of my bond, Bailey trusts me to work for me.

But actually, when we think of trained dogs, we tend to think of them as obedient dogs, but Bailey is an embarrassingly stubborn dog.

This is the direction you don't want to go

Do you know what I'm holding out for?

Spread your legs and stick your claws in, and never go in a direction you don't want to go.

While I was walking, I sat down on the street and I was wrestling with Bailey.

I'm being laughed at by passers-by

But I've never once said I hate going to the hospital.

On the other hand, when I go home, I'm not going home yet -- I sit down and go back inside the hospital.

Dogs can quickly sense what others think of them.

Bailey loves the hospital because it's a place where there are so many people who love her.

Humans and dogs love each other — I think that's the essence of facility dogs.

Dog stuffed animals that don't exchange affection are no good.

I can't do it with a robot

Bailey and the medical staff — this is the third bond.

Facility dog ​​handlers are health workers.

Why should healthcare workers be handlers? Because facility dogs aren't just about healing, they're about healing.

Bailey and I sometimes participate in discussions that help shape patient care.

On the spot, I also understand the patient's condition and think about how to interact with the child.

I will also write in the chart

This purposeful engagement is what only facility dogs can do, and why handlers are healthcare professionals.

It's been five years since Bailey and I started working in Japan.

I've met thousands of children

There was a terminally ill child whose condition was getting worse and he could no longer eat.

I wanted to eat, but I couldn't eat.

With little time left, my family and the nurses wanted to feed me as much as possible.

Then someone suggested, "Why don't you have dinner with Bailey?"

I smiled and sat with Bailey.

And then he said, "Bailey, look at me," and he grabbed a few bites of the spaghetti himself and put it in his mouth.

I ate a lot of ice cream, not reluctantly, but happily

Just being there with Bailey changes this much.

The image of the hospital changes so much that the child says, "I want to go to the hospital because I want to see Bailey."

When you're with Bailey, the fun doubles.

Feelings of sadness and fear can be half done

Most children leave the hospital in good health.

But unfortunately, there are children who become stars and go on journeys.

"You know Bailey is next to you, don't you?"

A sad but warm time passes

We may attend your child's funeral.

Imagine how your parents felt when they closed the coffin for the last time at the crematorium.

But my family always said, "I'm so glad you have Bailey."

tell me

"Without Bailey, it would have been a painful hospital stay."

"Bailey came and changed everything"

tell me

Families who lose a child think of that child every day for the rest of their lives.

It's a different feeling when you think back to "I felt sorry for you for having so many surgeries and how painful it was," and to think back to "I used to sleep with Bailey before he passed away and we were laughing together."

I think it would be great if we could create even a little bit of fun memories in the midst of painful memories.

I want you to remember as many of that child's smiles as possible

I strongly feel that facility dogs are not just nice to have, they are necessary.

Japanese medical care is said to be of the highest standard in the world.

I think we need a more positive environment where we can heal, not just heal.

It doesn't matter how many fun and happy things there are for patients.

There are many facility dogs in Europe and the United States, but there are still two in Japan.

Japan is a place where facility dogs are taken for granted.

So many cute children have turned into stars and are watching over us.

I want to make the Japanese medical field a place where people can confidently say to those children, "We've become a good hospital, aren't we?" (Applause)

This emoji means "smile"

this is also true

this is a mouse

this is a cat

this is a story

At the beginning of the story, this is a boy, this is a passing girl with a ponytail.

where this is the stage

this is the time when the story happens

This is the cassette player that girls carry around every day

cassette to put in

It's not so old-fashioned, I just like playing certain music out of cassettes.

It's a great pose

because she's a dancer

Now, the boy is thinking, all things considered, and he's thinking, "Honestly, the odds of dropping this kid are..."

(Laughter) He's like, "That's amazing!"

"I like you"

"I can't stop laughing"

I could have said something like "I want to hug you"

But what came out of my mouth

It was "I want to draw a picture of you on a coffee mug"

(Laughter) put a crab inside

add a little water

Add 7 kinds of salt

What this means is that when I say land, I suddenly want to stand on a narrow ledge above the sea.

He said, "You're like a mermaid, but you walk like you're dancing the waltz."

she said "huh?"

He said, "Yeah yeah I know

My heartbeat might be Morse code for "inappropriate"—

at least that's how it feels

Sometimes I'm like a junior high school cheerleader, swearing, awkward silences, simple rhymes

Talking to you right now, I feel like I'm not even a man

I'm a monkey— (Laughter) A monkey blowing a kiss to a butterfly.

but i want to see you again

First of all, I want to see you soon, and then I want to see you often

I'll be waiting for you tomorrow at 12 noon at the southwest corner of 42nd Street on Fifth Avenue with or without a ponytail.

just a ponytail is fine

I can't find anything else to say You can lend me your pencil

You can plug it into the phone

But the girl didn't move, didn't smile, didn't frown

I just said one word, "No, it's fine."

That's how it was

[You don't even need to write it] (Applause)

When you're on an airplane, you suddenly feel a tremor.

When you look out the window, nothing seems to be happening, but you and the other passengers are jolted all the way through the turbulence of the plane.

This may sound unnerving, but this phenomenon is one of the great mysteries of physics.

We've been studying turbulence for over a hundred years, but we know very little about how it happens and what its effects are.

And yet turbulence is ubiquitous and occurs in basically any system containing fluids in motion.

Airflow in the respiratory tract

For the blood that flows through the blood vessels

Even the coffee in the cup when mixed

Turbulence dominates things like clouds, waves crashing on shores, and plasma blown up by the sun.

If we could understand this phenomenon correctly, it would be fruitful in many aspects of our lives.

First thing I know

There are two types of motion in liquids and gases: laminar flow, which is steady and smooth, and turbulent flow, which is a collection of turbulent eddies.

think of incense sticks

The unturbulent laminar flow of smoke down there is steady and predictable.

As you go higher up, the smoke becomes more dynamic, unstable, and its movement patterns change chaotically.

That's turbulence, and turbulence has some properties in common.

First, turbulence is always chaotic.

this is not random

Turbulence is very sensitive to turbulence.

Giving you a little bit of stimulation can lead to completely different results.

Even with a lot of information about the current state of the system, it's almost impossible to predict what will happen in the future.

Another important property of turbulence is that we can see movements on different scales.

Within the turbulent flow there are many eddies of various sizes and shapes.

These vortices, large and small, interact with each other and break up into smaller vortices, transforming their motion into heat in a process called the energy cascade.

Turbulence is characterized as such, but why does it occur?

Flowing liquids and gases are subject to two opposing forces: inertia and viscosity.

Inertia is the tendency of fluids to keep flowing, which creates instability.

Viscosity acts to reduce turbulence, making the flow more laminar.

Viscosity works strongly in dense fluids like honey.

Low-viscosity substances, such as water and air, have a strong inertia and create instabilities that cause turbulence.

The direction of the flow is expressed by the Reynolds number, which is the ratio of inertial force to viscous force.

The higher the Reynolds number, the more turbulent the flow becomes.

For example, honey poured into a glass has a Reynolds number of about 1.

If it's water, the Reynolds number will be close to 10,000.

The Reynolds number is useful for understanding simple situations, but it's insufficient for many situations.

For example, the movement of the atmosphere is greatly influenced by factors such as gravity and the rotation of the earth.

For relatively simple things like the air resistance of buildings and cars,

Models can be created from many experimental results and empirical facts

But physicists want to be able to predict turbulence with the laws of physics and equations, just as they can model planetary orbits and electromagnetic fields.

To do that, many scientists believe, we'll have to rely on the power of statistics and powerful computers.

It is believed that ultrafast simulations of turbulence may reveal patterns that lead to a theory that consolidates predictions under different conditions.

On the other hand, some scientists believe that the phenomenon is so complex that it's impossible to come up with such an exhaustive theory.

I can only hope that there will be progress, because there is great benefit in truly understanding turbulence.

More efficient wind farms, countermeasures against destructive weather events, and maybe even deflect hurricanes.

And of course, there's also the comfort of air travel.

(Zach Kaplan) Keith and I have a research team.

We study materials and technologies, and they have surprising properties. Over the past three years, we've discovered over 200 of these things, and we've looked back at them and picked the six most surprising for TED.

First of all, the first of these six is ​​in the black envelope that you have.

It's from a Japanese company, Geltech. Please open it.

(Keith Schacht) Please divide it into two parts.

Surprisingly, this material is very soft, but it's also a strong magnet.

Zach and I have always been fascinated by unexpected things like this material.

We've been wondering why for a long time, and only recently did we realize that when we see something surprising, it changes our perception of the nature of things.

When I saw this gel magnet for the first time, I thought that it was natural for a magnet to be hard.

CA: It's important to understand what the surprising nature is.

And when you think about what that possibility means, it helps you think about how you might apply it.

The first idea is how to use it on a cupboard door

Because it's a gel material, if you put it on the edge of the door, it won't make a loud noise when the door is closed, and the magnetic force will close the door.

Let's say that same material is now applied to the bottom of a sneaker.

You can go to the hardware store and buy a sheet of metal to put on the back of the wardrobe door, and your shoes will literally stick to it without the shelving.

i really like this idea

(Laughter) If you come to my apartment and see the wardrobe, you'll understand why, because it's a mess.

Keith: If you look at these surprising properties and think about some applications, I think you can understand how important they are and what their potential is.

But we've also found that the way we express our ideas can make a big difference.

CA: That was six months ago, Keith and I were in Los Angeles, having coffee with Roman Coppola at Starbucks.

He works primarily on music videos and commercials for his company, the Director's Bureau.

As we were talking, Roman said that he was inventing on his side.

We showed him the same gel magnets that you have, and we introduced the same ideas.

He was really excited, and we saw the way he introduced the concept and we were like, "Wow, this guy is amazing."

The way he presents his vision -- his approach is so different from ours that it almost feels like it's already sold.

On the way home, on the way to the airport, we thought, why does it have such an impact?

The more I thought about it, the more I realized that it conveyed the same level of detail that you see on TV, so I took my favorite idea for TED, gel magnets, and created a commercial with Romain and the team at the Director's Bureau for a future product commercial.

(Narrator) Need speed?

Here's a challenge from Inventables Water Adventures Would you like to ride a water slide on a magnetic levitation board? Very fast, very high, and when it reaches the bottom, the stopping brakes are activated.

"Aqua Rocket" to be released this summer

(Keith) If I show this concept to some people, when are you going to release it? was asked

I'm sorry to say this, it's not actually going public, it's just an idea.

CA: Now, when you're envisioning an idea like this, it's important to make sure you're following the technical perspective.

Let me briefly explain how this works.

This is the magnetic levitation plate shown in the commercial.

The gels that you have are lined up on the bottom of the board.

This is very important for two reasons

The first is that the magnets are soft, so they won't hurt you if the rider hits your head.

And as you can see from the diagram on the right, the bottom of the slide is an electromagnet.

The magnetic levitation plate bounces back a little as it slides down.

This repulsive force, plus the force of the water rushing, makes this one faster than any slide.

So you need a magnetic braking system

When you get to the bottom of the slide (Laughter), the rider passes through the aluminum tube.

Now let's ask Keith to explain why it's important from a technical standpoint.

Keith: Engineers know that aluminum is a metal, but it's not magnetic. But when you drop a magnet into an aluminum tube, something strange happens.

So let me show you a simple experiment [Experiment 1 Brass]

[Experiment 2, Magnet] (Laughter) You can see the magnet falling very slowly.

I'm not trying to talk physics here, but what I want you to understand is that the faster the magnet falls, the greater the braking force.

CA: The next thing I'm going to show you is a three-meter stick, which is actually in my pocket.

(Laughter) There are several types.

(Laughter) (Keith) Some things grow automatically.

It can be automatically retracted, or it can be pinned so that it can be held in any position, like the one Zack has.

Zach: When I was talking to the sales company about how this was applied or applied, I heard that in the military, soldiers carry it in their chests, and when they go out into the field, they put it up as an antenna, and they use it to reliably send signals back to the base.

In Brainstorm, I came up with the idea of ​​using it as a soccer goal, and after the game is over, you roll the goal up and put it in your bag.

(Laughter) (Keith) The interesting thing about this is that you don't have to be an engineer to understand the fun of having a three-meter stick in your pocket.

(Laughter) We asked passers-by in Chicago if they thought they could do something about it.

(Male) I'd use it to clean the ceiling fan and remove cobwebs from the house.

(Woman) I'll take it as my cane

(Woman) I'll build a ladder to the top of the tree

(Woman) It's an olive server.

(Male) An extension rod, I guess, like a painter uses.

(Woman) I make a harp, and when I go deep-sea diving, I catch a fish quickly and put it back in, so I can swim easily.

(Laughter) (Zack) The next technology I'm going to show you is going to be a quick demo, so I'm going to ask you to volunteer from the audience.

please

(Laughter) What's your name?

(Steve Jarvetson) It's Steve.

(Zack) So Steve, come over here.

Please stand in front of this TED sign

there it is

and have this good luck

(Laughter) (Keith) Not yet.

(Laughter) (Zack) This presentation is courtesy of Target.

(Keith) A little more perfect perfect

Let me show you Zack, the future water gun battle.

(Laughter) Please come forward Come on, come on, it's okay

tell me the temperature of your shirt

(Steve) It's cold

Keith: As for why it's cold, it's actually not water in this squirt gun, it's a "dry" liquid developed by 3M.

Totally transparent, odorless and colorless

Safe to drink

(Laughter) It feels cold because it evaporates 25 times faster than water.

(laughs) Thank you very much for your cooperation.

(Laughter) (Zack) Hold on, Steve, I've got dry liquid in there, so you can shoot your friends during break time, during break time.

(Steve) great thank you

(Keith) Thank you for your cooperation.

(Applause) What's so great about this dry liquid?

It was originally used in the Cray supercomputer.

What's surprising about this material is that Zach can stand on stage and do absolutely nothing wrong with the audience, and you can soak them in water.

As you can see, submerging the circuit board doesn't do any damage.

Can be circulated to remove heat

But it's most commonly used today as a fire extinguishing agent in sprinkler systems in office buildings.

Again, it's harmless to humans. It extinguishes the fire and doesn't do any damage.

But the idea that we liked the most was to use it in a basketball game, where you just spray it on the players at halftime, it cools them down, it dries in minutes, it doesn't hurt the court.

CA: The next technology I'm going to show you is from a Japanese company, Sekisui Chemical, and there was an R&D engineer working on hardeners for plastics.

During my research, I noticed something surprising.

Watch the video [Ordinary plastic] [Shape-retaining plastic]

Keith: As you can see, it's irreversible. This was an unintended consequence of the experiment.

Technically it is called "shape retention"

Compare with aluminum foil

Shape retention is common in metals. If you bend aluminum foil, it stays that way. If you push the side of a plastic trash can, it will always spring back.

(Zack) For example, you can make a wristwatch out of this, you don't need a clasp.

Take it a step further and you can knit it like a little basket, and you can make a shape-retaining sheet that you can embed in a piece of cloth. You can make a picnic sheet to cover a table, and it won't blow away on a windy day.

The next technology I'm going to introduce is that it's hard to convey unexpectedness by itself, because it's ink.

So I'm going to show you a video of what it looks like on paper.

(Keith) When this paper is folded, the electrical resistance of the ink changes.

This electronic device tells you how much the page has been folded.

To think about the potential of this material, think about anything that ink is used in. Business cards, the backs of cereal boxes, board games, anything that uses ink will change the way you think about them.

Zach: My favorite idea is the application of this ink to a book.

It may completely change the concept of paper

You'll have black lines on the sides and top, and as you turn the pages of the book, the book will detect which page you're reading, by the curvature of the page.

What's more, when you fold a corner, you can program the book so that you can email the text from that page and look back at it later.

Keith: And the last technology I'm going to show you, I worked with Romain and the Director's Bureau team to create a futuristic commercial to illustrate how it works.

(Old milk carton) Yes, it smells good [After 5 days]

Who are you?

(New milk carton) It's new milk

(Old milk carton) I used to smell like you too

(Narrator) "Fresh Watch" from Inventables Dairy Farms

The color of the package changes as the milk ages.

Don't let milk ruin your morning

CA: This technology was developed by these two people, Professor Ken Suslick and Neil Rakow at the University of Illinois.

(Keith) So, how it works is there's an array of dyes.

These dyes change in response to odors

The vanilla scent, for example, changes the four on the left to brown and the one on the right to yellow. This arrangement allows for thousands of different color combinations, and therefore thousands of different scents.

If you know the odor you want to detect, like in a milk commercial, you can make a specific dye that detects just that odor.

Zach: When Professor Suslick and I started talking, he explained to me that this would allow us to do more than just detect spoiled food. And that's the whole point of this technology.

His research team surveyed firefighters across the country about how they assess situations when responding to an emergency.

And the professor, in a funny way, explained to me that a number of firefighters would say, "Rush to the crime scene, look around, and if there are no dead cops, you'll be fine."

(Laughter) It's a true story. Firefighters are using police as canaries.

(Laughter) No kidding, the professors decided to build a device that could be smarter than humans and tell firefighters if they were safe.

In addition, he started a university-independent medical device company called ChemSensing.

A patient comes and blows on the device

If it detects a specific bacterial or viral odor, lung cancer odor, etc., it will change color and software can be used to analyze the results.

This technique will greatly improve the way doctors diagnose patients.

Current diagnosis is "guess and confirm", but this device will diagnose exactly what disease you have.

Keith: These are the six technologies I introduced today.

All six of these things have changed our perception of what is possible. Before seeing these technologies, I never thought a three-meter stick could fit in my pocket, or that something as cheap as ink could tell me how to bend paper.

(Zach) Keith and I really enjoy doing it.

As you may have guessed by now, it was actually yesterday when I was talking to Steve on the first floor escalator. Chris sent me a little box, and one of the contents was hydrophobic sand. It's sand that doesn't get wet.

He was fascinated because he soaked the sand in water and took it out and it was dry and dry. A few weeks later he was playing with his mother's hair and noticed a few drops of water on his hair.

He held it in his hand, looked up at Steve, and said, "Look, hydrophobic fibers."

(Laughter) My thoughts are summed up in that story.

thank you

(Keith) Thank you

(applause)

I'm not very used to being on stage. Usually I'm on the other side of the lights.

As the person earlier explained to me about my background in detail, my motivation for making films is my inner sense of loss, and I'm searching for answers as I make films.

How it feels to be here to talk to you about my favorite sculptor, Giacometti, who spent many years in France studying sculpture and was the first person to be asked when he returned home.

What have you been producing abroad for many years?

When he showed me a small pottery

People say, "Even though I studied in France for many years...

I can't make anything big..."

But I think that each of these little works is a fragmentary expression of the life and way of thinking that he achieved.

I am the same now

I feel like returning to my hometown after a long absence and telling you what I have learned in the West for 20 years.

Today I'm going to show you a small selection of two feature films and a few short films to give you a little idea of ​​what I've been doing.

Then from the first

Mama said it was my fault

i love you mama

i'm not a real mom

my parents abandoned me and went back to nigeria

'Cause I'm a nuisance, Court

don't sleep anymore

Have you been there?

where

I'm Nigeria

no

mother wanted to go but she couldn't go

if i go

i wish i could be happy

Everyone I'm in the way

i won't let you go

you are the same

you're gonna throw me away

what are you doing

reading a book

without getting tired

don't you work?

I retired

So?

I'll work for myself from now on

I'm just lazy

i'm just doing what i like

Reading doesn't fill my stomach

You can't even buy a leaf

my heart is filled

I'm not talking to you

you're a rapper

ah

you must be a poet

That's what it is

what are you singing

what are you doing

content of words

current condition

Whose?

my daily life

let me ask

With racism and the recession, there's no room for action.

So how do you solve it as a poet?

AK-47 or

oh i wish i could get it

So how many friends have you gathered?

I'm really sorry

Even if I say it to Matomo, he won't listen, so I guess I'll show my intentions in a rough way.

are you kidding me

Panther Party

Panther party?

Those who hate white supremacy in power and provoke their comrades to gain power?

I saw the movie, but it sucked

i saw the latest

It's "Epuise"

yes

It wasn't bad, but it was a literal piece of work.

It's a boring, boring, terrible movie.

keep it around

what do you think of my work

say it

it's crap

how is yours

Wha... what is it

what do you think of your work

From "Documentary"

my work is much better

I often say that

Why don't you get out of Hollywood and shoot the truth of the world?

It's all your work

I'm going to sleep because it's crap

(Applause) Thank you very much. My first film is about what cinema means to me and my position in making films.

What is the feeling of the girl in the film who wants to go to Nigeria and live a happy life?

I can sympathize with those who are away from home

I feel the same nostalgia as her

It's been five years since I last went home.

It's been 20 years since I first came to a foreign country

Then, in 1997, the military suddenly took power in my hometown, beginning the dictatorship of General Abacha, the worst era since the colonial era.

A girl's dream is the thought of her hometown that everyone feels

The reality at home may be harsher, but people who find themselves in situations of loneliness still need some emotional support.

In the next piece, a young man says that blacks have no chance in Europe, and they think that the so-called glass ceiling doesn't allow them to flourish.

And that's my feeling, too: I wanted to bring up the meaning of multiculturalism in a multicultural Britain that ordinary people feel.

The boy named Jamie in this work can't control the irritation in his heart.

Patience is close to the limit

The use of violence as an outlet is the same as in the ghettos of L.A. that we're used to seeing and hearing about, and that violence eventually turns into riots. Two years ago, when there were riots in France, I became disillusioned with free France.

18 years in the UK

I came to France four years ago, but it reminded me of when I was back home.

The final piece is a question to myself: What do I want to do with my films?

Here, a young Hollywood director is having a film discussion with his friends.

My latest work is what cinema means to me.

I was born in 1966, a few months before the start of the three-year civil war.

This situation is reflected in my childhood and my next work.

go to school with your brother

yes mom

Look, you guys are going to fight as soldiers, you're ready to die

anytime

give my life

you need a lot of guns to win

a lot of guns

this is the gun

this is the gun

Save a life with this AK-47 rifle

This will protect my life This is... your... lifeline

we were drugged

It's a stimulant

Even if it rains, even if it's hot

Soldiers go anywhere

we have some villages

was taken around

2 days without eating

kept walking

just eat a little rice

it was very painful

what was wrong with being injected

God forgive

we didn't know anything

January 6th, 1999

i don't remember

Ezra! Onicha! ♫ No more war ♫ ♫ No more needless deaths ♫ You killed your mother

this bastard

(shouting) this picture

it's me

Why

stared at me

It's going to be a long story

let me know

have a child

You're like a crocodile

All I can say is I'm lingering

A coward who can't go against his superiors

That guy abandoned his men

Say goodbye to everyone

wake up ezra

Diamonds are in his pocket

♫ No more fights ♫ You idiot

Are you about to attack?

this is mine

the woman is here

well done

thank you for your cooperation

you'll come back and fight

♫ No more quarrels ♫ Wake up, the roads are blocked ♫ Stop fighting now ♫ ♫ I want to live in peace ♫ ♫ Live in peace ♫

♫Nothing like this...♫ From now on, with your cooperation, this committee will reveal the truth about the anti-government activities.

Through a series of procedures, I intend to put an end to this country's historical dark side.

Then

Mr. Ezra Geller, please stand up.

name and age

Ezra Geller

I think maybe 15 or 16

ask my sister she knows everything

I'm 16 years old, Mr. Geller, and I'm not here to judge your crimes.

we fought to be free

If killing people in war is a sin, then all the soldiers in the world are sinners.

War is a crime, but I didn't start it.

you were a retired general

Yes, that's right

then you are guilty too

the government was corrupt

In order to maintain power, education was also perfunctory.

Do you pay school fees in your country?

no i won't pay

we are poor

I can't study without paying school fees

Your country is a democracy and you support the corruption of my government.

i want so many diamonds

Who among them has seen a real diamond?

do not heal

Mr. Geller, this is not your trial.

Therefore

I'm leaving

that's no good

you're still a liar

(Applause) So let me give you a quick gist of it: I grew up with Ezra in the making of this piece. For Africa to move forward, we need to record the past and not repeat it.

thank you

thank you

(Applause) One of the things you've done that really struck me was the trauma that these young people have who are forced to become child soldiers.

How does it feel to you, being from Nigeria, that these facts are not taken so seriously?

During the research phase, I actually stayed in Sierra Leone.

I met a lot of child soldiers who said they were "ex-combatants."

beside them

I also interviewed people who provide psychological care, philanthropists, etc.

On the flight home, I couldn't help but cry when I thought that if a child in "Western society" had the experience of an African child for even one day, he or she would need psychological treatment for the rest of his or her life.

We have these children, a generation of children living in Africa with some kind of deep emotional scars.

Still, Africa will move forward and develop

i think

Thank you for coming today.

I was very impressed

thx

you're welcome

(applause)

I think the future of the planet depends on humanity, not technology. We already have the knowledge to do that.

I don't see even a dead end when it comes to cognition.

still stuck in the dark ages

In the TED talks about all the amazing human abilities and knowledge in every field, remember that this planet is still called Earth. I can't believe it.

Aristotle said this planet is not flat, it's round

With his trial coming up, Galileo had to be humble, but he insisted that the Earth wasn't the center.

The Hawks take it this way: "This isn't a ``earth'' globe, it's a ``water'' globe."

this is an ocean planet

It's what Elliott said to me. It might give you goosebumps. "There's no end to exploration. The end of exploration is the return to the first known starting point."

"The place you find at the farthest end of the world after passing through the unknown gate is the beginning of everything."

I have a message for you here

I think we're headed in the wrong direction

There's probably a rocket engineer here. The work itself is nice. It takes guts and courage.

(Laughter) It's all a matter of perspective.

I'll give you an example. Don't be offended. Listen. It's taken as an insult, so I won't actually do it.

Let's say you cut out one square foot of land, and then you cut out two square feet out of the ocean, which is 1.5 times the size.

Relative contribution

I'm sure you all will say, "I know." The surface area of ​​water on Earth is twice that of the land.

But it's a matter of perspective, and if you're foolish enough to think this way about this oceanic planet we call Earth, if you think it's a two-to-one relative importance, you're about ten times as wrong.

I wouldn't say it's crazy stupid, but when I say "Earth," it sounds a little silly, because with this angle of view, a piece of the Earth becomes as thin as a piece of paper.

It's like a 2D flimsy film

The ocean adds depth

And if you lift those two together, you'll find that the relative numbers are 20 to 1.

We know that more than 94% of life on Earth is aqueous.

In other words, terrestrial life is in the minority.

The problem with human beliefs is that we have to let go of the notion that the earth was made for us.

this is our problem

If this is an ocean planet and we're a minority, it's not good for us.

Now let me make a little criticism here.

I'm not criticizing James Cameron, although his story is good today.

Check out his latest movie, Aliens of the Deep, it's amazing.

These two submarines are the stars.

I think this is one of the most beautiful classic submarines.

You can see the sphere at the top.

This sphere is acyclic

This is what creates all the buoyancy and payload, with a balloon-like battery at the bottom.

This is the air sac, this is the gondola

I'll take a closer look later, but I can't get a huge light either.

It also has two high-tech manipulators.

It's a really great submarine, great design.

The problem is that it's made with two-dimensional thinking, so I'm not going to make the same kind of thing again.

This is typical of engineers trying to dive. We have to consider obstacles and constraints on the ground, but these two-dimensional constraints are so powerful that we don't even understand them, and yet we bring them underwater.

As you can see, Jim is seated.

This is only possible in a 2D world where gravity is on the seat Okay?

And while the two-dimensional world has knowledge of the third dimension, it's neglected because it takes an enormous amount of energy to defy gravity.

Mothers say, "Don't fall."

Now let's think about what's in the water

There are two types of interior environments on this planet: the inner hydrosphere and the outer gaseous atmosphere.

Most life on earth lives in the water

We live comfortably in a three-dimensional world unknown to mankind.

fish don't sit on chairs

(Laughter) I won't sit down. Fish mothers don't tell their young, "Don't fall."

I won't fall, I won't fall

In their three-dimensional world, energy consumption is the same wherever you go, up, down, front, or back.

A true 3D world

Humanity has only just stepped in here

I have never seen a submarine other than mine, whether unmanned or manned, that utilizes the characteristics of the three-dimensional world.

This is the correct way to dive

This is a three-dimensional submarine

In other words, underwater, like aquatic organisms, they should be able to swim freely in the three-dimensional world.

this video is amazing

This is the first attempt to fly undersea in human history.

A huge manta ray swimming elegantly came into view

Her width is twice as wide as mine

look at this

Look how she turns. She doesn't have a seat, she doesn't have a tank, she just turns to ascend or descend.

Footage of this submarine is released today for the first time.

Chris asked me to show an unreleased video.

Did you notice that she circled back?

You can see it coming back up from the bottom

I'm slowly diving with reverse thrust

I try to be gentle with every movement.

I was diving for three hours, so I started to feel a sense of intimacy.

she dances the perfect ballet

I got too close and got away for a bit

I'm trying to track her down, but this is my first flight.

I'm still practicing and it's not going well This is the first prototype

It's fly-by-wire, and it has wings.

No weird buoyancy tanks, of course you can get buoyancy forever

Gain control by flying through water

look

circled from below

This is the only time I've dived in this submarine.

took 10 years to create

Well, I really learned a lot from her

I learned a lot during this three-hour underwater flight.

I have to make another one

Instead of pumping air into the tank and slowly ascending while thinking about this and that, with a little bit of back pressure, you can still ascend in a straight line like this.

This internal camera is made by Sony Thanks Sony

I don't look too bad, but the camera is too close, so the image is a little distorted.

I'm here again I'm swimming above

This camera is capable of wide-angle shooting

swimming just above my head

"Hahahaha, it passed right above my head, oh wow, it was really close."

I'm on the surface. It's not a breather.

"It was an amazing encounter with manta rays. What can I say?"

"It was just a stone's throw away. Let's dive in again."

ok can you stop Please turn the lights back on

(Applause) I tried to swim with manta rays, but the problem wasn't lack of mobility.

Actually she was too late

I thought it would be better to move agilely in the water and expand the range of movement, so I designed it to be able to move at high speed.

After meeting her, I wanted to dance with Manta again.

she wanted to dance

We had to widen the wing surface for grip and strength.

Here is the model I completed last year.

I see huge wings

It's so cool, and it made me want other people to enjoy diving.

So we opened the world's first undersea flight vocational school.

In the past, the Coast Guard didn't really care when we were making these little weird spheres float, but when we actually started diving in the jet-propelled submarine, they seemed to get a little more sensitive, and they started approaching us and asking, "Do you have a license?"

So I put my sunglasses on my bearded chin and answer, "I don't need a license."

(Laughter) Now I'm writing a lame license.

My name is Bob Gelfon, and there's someone in the hall with license number 20.

One of the world's first undersea aviators

I run two schools now.

I don't know what you're aiming for, but it's fun

I don't know what's waiting for me in 30 seconds underwater.

By the way, Karen and I were trying to patent an undersea flight, and we weren't sure about it because our partners wanted us to patent it.

I decided to leave this alone

(Applause) Taking away the freedom of undersea flight.

If you want to imitate us or want to participate, feel free to do so.

We have also achieved low cost

Also, this morning, Craig Bentner asked me to make an announcement that we're going to make an even smaller version of this, an unmanned deep-sea exploration boat, to collect deep-sea DNA.

(Thank you for applause

Hello everyone

this is sophie

it's okay don't worry

(Laughter) I'm sure the people in the second floor are glad they put them upstairs.

(Laughter) Now this is Sophie, not Sophia, Sophie.

named after french

Do you know why?

(Laughter) For many people, Sophie is scary.

Too many legs, too hairy, big and uncomfortable

But to me, Sophie is an amazing piece of bioengineering.

Sophie represents all the creatures that have survived since the beginning of time, all the creatures that have succeeded in producing offspring for generations to this day.

Over a billion years ago, primitive multicellular life began to evolve on this planet.

It took spiders 430 million years to get to where they are today. They're the most versatile, the most diverse, the most evolved creatures -- (Laughter), one of the greatest predators on earth.

Don't you think it's pretty cool to put a tarantula on your hand and give a speech like this?

(Laughter) And let's not forget, Sophie, and all of us, are testaments to our ancestors, who fought and survived in a fierce struggle for survival.

Each of us in this hall is the result of a billion years of unbroken triumph.

In Sophie's case, one of the reasons she survived is in her chest, just below her eyes.

There are poisonous glands attached to the poisonous fangs, which are tucked into the mouth.

Without this poison fang and poison, Sophie wouldn't have survived to this day.

Many creatures have evolved venomous mechanisms to survive.

It turns out that all kinds of venomous snakes, spiders, and scorpions each have their own venom, which is made up of dozens of compounds.

These compounds were developed for a single purpose: to paralyze and kill the enemy.

Toxins actually have different effects.

Poison can inflict pain like you've never experienced before.

It can even stop the heart and turn blood into jelly within minutes.

It can also instantly paralyze enemies or dissolve their bodies like acid.

It's a chilling story, isn't it?

I'm very excited

Why?

It's not because I'm a pervert

(Laughter) Imagine taking all those powerful compounds and making them useful to us.

Sounds great, doesn't it?

For example, you can use that toxin to create new antibiotics.

What if we could help people with diabetes or high blood pressure?

As I speak, there are actually studies like this being done by scientists like me all over the world.

A drug commonly used to treat high blood pressure was actually created from the venom of a venomous South American snake.

Some type II diabetics are being treated with venom from lizards in North America.

And hospitals around the world are developing procedures to use marine snail venom for anesthesia.

Venoms harvested from hundreds of thousands of organisms are a rich repository of compounds for us.

And— oh hey, he wants to go for a walk.

(Laughter) Spiders alone are thought to produce more than 10 million compounds with potential therapeutic applications.

10 million species

How much of that do you think has been researched so far?

about 0.01%

So that means 99.99 percent of the other compounds are still unknown, waiting to be picked and studied.

Until now, scientists have focused their studies on the most visible and dangerous creatures: habs, cobras, scorpions, black widow spiders.

But what about those little bugs that surround us?

A spider behind the sofa at home?

You're at home watching TV and suddenly they walk across the floor and startle you.

there will be one at home

(Laughter) What about those spiders?

Could these tiny spiders make some amazing compounds?

A few months ago, the answer would have been "I don't know."

But now, when my students and I started to do some research, it turns out that those little spiders also make some really interesting compounds.

I'll get to that later, but first let's talk about "we're starting to do research."

how do you do your research?

First of all, me and my students will catch a lot of spiders.

how?

you will be surprised

Once you start looking, you'll find tons of them.

are everywhere around us

In a matter of hours, we can catch 200 to 400 spiders, and we bring them back to the lab and put them in individual baskets.

feed each

I'm sure everyone is thinking, "This guy is crazy.

You're running a spider hotel at work..."

(Laughter) No, it's not.

You put the spider in a cage, wait a few days, and anesthetize the spider.

When they fall asleep, they run a tiny electrical current through their body, which causes the poison glands to contract.

Under a microscope, you can see a tiny drop of venom coming out.

Here, a glass tube as thin as a hair is used to collect the drop.

Then pick up the spider and put it back in the basket and repeat the process.

This process doesn't harm the spider in any way, so after a few days it can recreate its venom and, when it's recovered, it can be released back into the wild.

It would take hundreds of spiders to harvest the same amount of poison as raindrops.

So that drop is very precious.

Once it's harvested, it's frozen and machined to isolate and purify all of the compounds in the venom.

We're dealing with very small doses of poison here.

It's a very small amount of a compound, about 0.1 microliters. You dilute that compound thousands of times with water, and then you watch how cancer cells, bacteria and other nasty things react to it.

This is the real thrill of my work.

For me, it's like, "I'm in Las Vegas."

(Laughter) We spend a lot of time and resources preparing compounds and testing them.

most of the time nothing happens

absolutely

But very rarely, if you're lucky, you'll discover a compound that works wonders.

just like the jackpot

Saying that, let's take it out of our pockets It's very scary Are you ready?

(Laughter) Inside this little tube is a very common spider.

It's in the storeroom, it's in the basement, it's in the sewer, I mean, it's in the toilet.

This spider produces a powerful antibacterial compound.

This powerful antibacterial compound can also kill the drug-resistant bacteria that bother us all the time.

And honestly, if I lived in a sewer pipe, I'd make antibiotics.

(Laughter) But this little spider could be the solution to a serious problem we all have.

Around the world, about 1,700 people die every day from infections caused by drug-resistant bacteria.

Multiply that by 365 and you get a staggering calculation of about 700,000 lives lost each year, because antibiotics that were effective 10 to 30 years ago can't kill common bacteria today.

The world is running out of antibiotics, and the pharmaceutical industry has yet to find a solution to this problem.

Thirty years ago, there were 10 to 15 new antibiotics coming to market every few years.

How many do you think have come to market in the last five years?

there are only two types

Realistically, if we continue at this pace, we'll reach a point in the next few decades when we're completely out of control of infectious diseases, and we're going back to where we were 90 years ago, before penicillin was invented.

The reality is that we are in the middle of a war against an invisible enemy, one that has the ability to adapt and evolve far more rapidly than humans.

And in this battle, this little spider could be a powerful secret weapon.

A half microliter of venom diluted 10,000 times can kill most of the bacteria that no antibiotics will work against.

that's totally awesome

Every time I do an experiment, I think, "How is that even possible?"

What potential do other poisonous creatures have?

What kind of wonderful products can be created through proper research?

So if you ask me, "Is there really a future for therapeutic drugs in insects?"

I answer, "There must be something hidden that is the key to the solution."

We need a way to do that research

So if you come home tonight and find a spider in the corner of your room...

(laughs) please don't crush me

(Laughter) Admire it. And don't forget that it's a wonderful creature.

You no longer feel that this child is meaningless, do you?

(laughs) Thank you.

(applause)

For your son's sixth birthday, you promised to give him the cutest creature in all of creation: Cudry.

Believe it or not, Cudley is part of the dreaded 'Dudley' and the infamous 'Fadley'.

They're all members of the "Wadley genus," and they're born through a very peculiar breeding process.

100 eggs are used to make one Wadley.

If you put 100 eggs together in an incubator, the eggs will fuse and start mating.

Blue and purple make a "red" egg

Red and blue make a "purple" egg, and red and purple make a "blue" egg.

The first pair to pair is the egg with the highest number of colored eggs.

Keep mating until you have the last egg.

If the last egg is blue, a 'Cadry' is born.

Purple means "Dudley" Red means "Fadley"

The incubator now contains 99 eggs.

23 blue, 33 purple and 43 red

Add one egg of any color and the eggs will start to fuse.

When all the eggs have finished mating and there is only one egg left, the egg will hatch and will soon become attached to you.

'Cause I made a promise to my son

So what color eggs do you have to add to the incubator to get a "quadry"?

Let's pause the video here and think about it.

3 seconds to answer 2 seconds to answer 1 second to answer You will be confused by all the cuddly, dudley and fadley from different colored eggs.

If you don't think about the total number of eggs of each color, and just focus on the process of egg fusion, you might find some clues.

When two eggs fuse, each of the two colored eggs loses one and the remaining colored egg gains one.

What this means is that the even-oddness of all three colored eggs -- even or odd -- changes at the same time.

Now all three colors are odd, but if you add an egg of one color, the egg of that color will be "even" and the eggs of the other two colors will be "odd."

No matter what color you choose, it will always be the opposite even-odd of the other two colors. If it's even, it's odd, and if it's odd, it's even, because in any fusion, the odd-even of the three colors of the egg are reversed at the same time.

We want to end up with "1 blue, 0 purple, 0 red" and "odd, even, even."

So, at the start, we want the even-oddness of the blue egg to be opposite to the even-oddness of the red and purple eggs.

So you add one blue egg, and after all 99 eggs have fused together, you're left with just one blue egg.

A hatched Cudry would make my 6-year-old son supremely happy.

Please follow the store clerk's advice and don't feed after midnight.

In 2012, a joint Japanese-Danish research team set a world record by transmitting 1 petabit of data per second, the equivalent of 10,000 hours of high-definition video, over 50 kilometers over a single cable.

it's not just a cable

It was an improved version of the hidden network fiber optic that connects the planet and makes the Internet possible.

For decades, long-distance communications between cities and countries were carried out by electrical signals over copper wires.

This was slow and inefficient, with metal wires limiting the speed of data transmission and waste heat taking away some of the transmission capacity.

But at the end of the 20th century, better transmission methods were developed.

Instead of metal, glass is carefully melted and processed into bundles of fibers hundreds of kilometers long that are flexible and thinner than a human hair.

And this fiber, instead of electricity, carries pulses of light that represent data.

But how does light travel "inside" glass?

The secret is a phenomenon called total internal reflection.

Since Newton's time, lens makers and scientists have known that light bends as it passes from air through materials like water and glass.

When a light ray traveling through glass hits the surface of the glass at a steep angle, it is refracted, or bent, as it travels through the air.

But at shallow angles, the rays bend too much to pass through the surface and bounce off the glass.

Under the right conditions, glass, which normally lets light through, can keep light inside.

Compared to electricity or radio waves, fiber optic signals can travel long distances with little degradation, but they do scatter some of the light, and if you bend the fiber too much, light leaks out.

Today, a single optical fiber carries many different wavelengths of light, each carrying a different channel of data.

And inside a fiber optic cable, there are a lot of these bundles of fibers.

There are more than a million kilometers of cables crisscrossing the ocean floor, connecting continents -- they're long enough to circle the equator 30 times.

With fiber optics, distance doesn't matter so much, and that's how the Internet evolved into a global computer.

Increasingly, the mobile world relies on armies of hard-working servers housed in giant data centers around the world.

This is called cloud computing, and it causes two big problems: waste heat and bandwidth crunch.

Most Internet traffic travels back and forth through data centers, which are made up of thousands of servers connected by old-fashioned electrical cables.

Half of the electricity used there ends up as waste heat.

Also, the demand for wireless bandwidth continues to grow, and the gigahertz waves used in mobile devices are reaching the limit of how much data they can carry.

It seems that fiber is just too good, and the expectations for cloud and mobile computing are too high.

But a related technology, integrated photonics, came to the rescue.

Light can be carried not only by optical fibers, but also by very thin silicon wires.

Silicon wire can't carry light as well as fiber,

A network of hundreds of kilometers of fiber optics can now be packed into tiny photonic chips that can connect to servers and convert between electrical and optical signals.

Thanks to this conversion chip, the electrical cables used in data centers can be replaced with power-efficient fiber.

Photonic chips can also push the limits of wireless bandwidth.

Researchers are trying to replace gigahertz waves in mobile devices with terahertz frequencies to transmit data thousands of times faster.

But they all travel very short distances because terahertz waves can be absorbed by water vapor in the air or blocked by tall buildings.

Tiny radio-to-fiber transmitter chips scattered all over the city can cascade terahertz waves and transmit them over long distances.

And that relay, with fiber optics as a stable intermediary, enables ultra-high-speed wireless connectivity.

Throughout history, humans have depended on light to see and to harness heat, and it has always been a part of our process of exploring and inhabiting the physical world.

And now, we're building an ever-expanding virtual world by carrying information in light and running fiber optic superhighways that incorporate many exits in the form of integrated optical circuits.

18 minutes isn't enough time, so let's go straight to the point to make sure the story goes well.

So the point I want to make is

Five. First, why is it desirable to stop aging?

Why we need to share our wisdom Why we need to take more proactive action now

Now I'm going to talk about the possibility of stopping aging.

And about "aging," for some reason we tend to let fate take its toll.

On that issue, later in the story, I'll show you how wrong the fatalist view is, and if you deal with it, you'll see.

I'm thinking of proving it in two steps.

The first thing I'm going to talk about is if we can achieve modest lifespan extension, and then -- if we're talking about people who've already reached middle age, and life extension is defined as 30 years -- we're going to get to the point where we can call it purely anti-aging.

Essentially, it's disconnecting your age from your chances of dying in the next year, as opposed to your chances of getting sick before that.

And, of course, the last thing we're going to talk about is what the intermediate steps will be until we're able to extend that 30-year lifespan.

So let's get started: "Why should we stop aging?"

First of all, I would like to ask you

Raise your hand Who thinks malaria is good?

oh good thank you

Raise your hand again, who of you doesn't know if malaria is good or bad?

everyone thinks malaria is bad

good, that's the answer i thought it would be

Let me tell you, the reason I think malaria is bad is because malaria and aging share the same characteristics.

The characteristics are

The only difference is that aging kills far more lives than malaria.

Today, I'd like to make a special comparison to the UK, where fox hunting was, after much debate, banned, by the government, not so long ago.

I think everyone here today would agree with me, but many people don't necessarily agree with that logic.

I think it's a good comparison

Many people will say, "The city people have no right to tell the rural people how they spend their leisure time.

For rural areas, it's a part of life and a tradition.

It prevents the breeding of foxes, so there is no environmental problem.

But it was ultimately squashed by the government because British public opinion, and above all, the majority of MPs, came to the conclusion that it was unacceptable in a civilized society.

From my point of view, aging and this problem definitely have common characteristics.

So what's stopping us from understanding?

Not just in terms of living, of course. (Laughter) In terms of healthy living, it's not fun to be weak and miserable and lonely, whether you enjoy dying or not.

So I really want to say this

It's a "global delusion"

As you can see, some of the excuses for aging are pretty incredible.

I'm not saying that those excuses are totally worthless.

And there's a good thing, too, because we put a lot of thought into our preparations, like to minimize the confusion when things go so well that we actually find a way to prevent aging.

But this is still weird, and if you follow your sense of balance, you'll understand.

May I? It's a debate, and it's a very real, worrying subject.

is this so dangerous? -- I'm talking about the risks of dealing with aging -- the opposite -- outweighing the risks of leaving aging alone. Is that dangerous?

Is that argument worse than sending 100,000 people a day to unnecessary premature deaths?

If you don't have a strong argument, please don't let me waste your time.

(Laughter) There's something that some people have been insisting on.

There are people who worry about overpopulation, and they say, "If we stop aging, nobody will die, or at least we'll have a lot less deaths, unless we accidentally cross St. Giles Borough.

Then you won't be able to have many children, and children are precious to many people."

That's right

A lot of people try to obfuscate this question or just answer like this.

I disagree. Doesn't answer your question.

We will soon face a dilemma

You have to choose between low birth rates and high mortality rates.

High mortality rates will continue to come from refusing anti-aging treatments instead of having more children.

Therefore, future humans have the right to choose it.

The bad news is that we make the choices for future generations.

If we don't develop anti-aging treatments as quickly as we can, we'll end up killing a lot of people.

This is my answer to the overpopulation problem.

So let's move on. Why should we be more proactive about anti-aging?

The basic answer is that pro-aging delusions aren't as stupid as they look.

It's a smart way to deal with the inevitable aging.

Aging is horrifying, but aging is inevitable, so we have to find a way to keep it out of our minds.

For example, making up some silly reason that aging is ultimately a good thing.

But it works best when both of those factors are present.

When that inevitability becomes even a little less clear when it comes to doing something about aging, that itself becomes part of the problem.

False pro-aging delusions rob us of the power to tackle aging.

So we need to have a lot of discussion about this, I would even call it evangelism, to get people's attention and to make them aware that they are delusional in that sense.

that's what i want to tell you

Now let's talk about feasibility.

The fundamental reasons why we believe aging is inevitable are summarized in the definition of aging that we present here.

very simple definition

Aging, I guess you could call it "metabolism," is a byproduct of life.

It's not a completely tautological statement, but it makes sense.

Aging also affects inanimate objects, like cars, and living organisms like us, because despite their many ingenious self-repair mechanisms, they are imperfect.

Basically, "metabolism" is the by-product of any system that allows us to live from today to tomorrow.

The by-products accumulate and eventually become "pathology."

It's a nice definition, but it's rephrasable: the sequence of events.

There are effectively two types of remedies for slowing down aging.

A "gerontological" approach and a "geriatrics" approach.

In gerontology, we intervene late after the disease has been identified. The gerontologist is like stopping the hourglass, trying to stop the build-up of disease-causing byproducts immediately.

Of course, this is a very short-term strategy, and it's a losing battle, because the number of causes of disease increases over time.

The "gerontological" approach, on the other hand, seems more promising at first glance, because prevention is always better than cure.

Unfortunately, we don't fully understand "metabolism."

In fact, we pitifully don't understand how life works, and we don't even fully understand cells.

For example, phenomena like "RNA interference" were only discovered a few years ago, and it's a very fundamental component of cell life.

Gerontology is ultimately a good approach, but it's still underdeveloped when it comes to interventions in aging.

So what should we do?

The logic is clear, convincing, and uncontroversial, doesn't it?

but it's not

Before I tell you why, let me explain what I call "the second step."

For the purposes of today's discussion, let's assume that a middle-aged person, say someone around the age of 55, gains the ability to stay healthy for another 30 years.

Now let's call this "Powerful Rejuvenation of Humanity (RHR)"

What does this mean? For people of all ages, it's the same thing for years, but at what age do these treatments become available and they actually live?

The answer may seem simple, but it's not that simple.

"If you're young enough to benefit from this treatment, you'll live 30 years longer."

that answer is wrong

because they overlook technological advances

There are two kinds of technological advances involved.

One is fundamental breakthroughs, and the other is incremental improvements to those breakthroughs.

They are very different in terms of time unit of prediction.

It's very difficult to predict how long it will take for a real breakthrough to happen.

People have long believed that flying would be fun, but it wasn't until 1903 that they actually did.

Progress after that was steady and constant.

I think the advances in powered flight technology happened in a logical order.

You could say that later inventions are beyond the imagination of the previous inventors.

Gradual progress continues to the point where it is no longer gradual Progressive progress continues to the point where it is no longer gradual

This is what comes after a radical breakthrough.

You see this in every technology field

We see this phenomenon more or less in the progress of computers.

Medical technology has gone through a similar time course, from hygiene to vaccines to antibiotics.

I just called it "the second step," but it's not really a step.

In fact, people who are young enough to benefit from anti-aging treatments that have moderate life-prolonging effects are, in a sense, edgy, even though they are already middle-aged when treatments become available.

Most of them survive and receive more advanced treatment, which can add another 30 to 50 years to their lives.

keep winning the game

Treatment advances faster than life expectancy catches up with the imperfections that remain in treatment.

this is very important for you to understand

Because when most people hear my prediction that many people alive today will live beyond 1,000 years, they think that in the next few decades, they'll invent a cure that will completely stop aging and extend their lifespan to 1,000 years or more.

i don't say a word

All I'm saying is that if the rate of progress of this treatment accelerates, that's good enough.

Even if the cure isn't perfect, it means we can cure the disease that kills 200-year-olds before we turn 200.

Whether it's 300 years old or 400 years old, it's the same

I gave this thing a name, "escape velocity to longevity."

(Laughter) Well, you seem to understand.

These curves are predictions of how much life expectancy will increase, the age at which anti-aging treatments become available, and the life expectancy at that point in time given the state of health.

If you're already 100 or 80 years old -- for those with an average age of 80, this anti-aging treatment probably won't help -- those people may be too close to death for the first experimental treatments to be effective.

will not be able to tolerate the new treatment

But if you're in the 50th place, you have a chance. You're sinking, you're rising (Laughter), and you might end up getting through it.

And if you're younger, you'll never be weak enough to die because of age.

The bottom line, in all honesty, is that we don't know how old the first person to live to be 150 is today, because we don't know how long it will take to develop the first generation of treatments.

Regardless of how old the person is now, I'd argue that the first person to live to 1,000 years would be no more than 10 years younger than the first to 150 years, depending on whether there is a global catastrophe.

this is amazing

Now, for the remaining seven-and-a-half minutes, we're going to talk about the first step.

I need to tell you about the mouse experiment.

There is an indicator that corresponds to the “powerful rejuvenation of mankind”

I call it "mouse rejuvenation rejuvenation (RMR)."

This one

We're going to use long-lived strains of mice, mice with an average lifespan of about three years.

In experiments, mice don't do anything until they're two years old.

After that, they try all sorts of methods and treatments to extend their lifespan, and they live to an average of five years old.

So, adding two years, we tripled the remaining life expectancy from the time we started treatment.

The question is, what does this mean for humanity, the attainment age that I just gave you as an indicator?

As I've already explained, we can now call it "Human Powerful Rejuvenation" or "Escape Velocity to Longevity."

The second question is, how does the public understand the time it takes from success in mice to first human application?

And the third question is, how much do people want it?

The first question is extremely difficult for me to answer because it's a purely biological question.

It becomes speculation, and many of my colleagues will say that we shouldn't speculate.

but that's nonsense

It would be extremely irresponsible for us to remain silent.

We should make possible guesses about the foreseeable period, and we should give people a sense of balance so that they can assess their priorities in life.

The chance is five minutes and five minutes. The powerful rejuvenation of mankind will come within about 15 years of the powerful rejuvenation of mice.

Look, 15 years after Mouse.

The general public may think it's shorter.

The general public tends to underestimate scientific issues.

You might think that the human application would be five years at most.

It's wrong, but it doesn't matter

In closing, I think I can also say that a large part of the public's volatility in attitudes toward aging is about what I call the "global delusion" of how we deal with aging.

It's going to be a thing of the past, because people won't believe that aging is inevitable, because they've extended lifespans in mice.

So people's attitudes change a lot, and of course that makes a lot of sense.

To tell the story of the mouse experiment, let me add a little bit to the explanation of aging.

The word "damage" is something that happens in the process of metabolism that eventually causes disease.

The important thing about damage, which ultimately causes disease, is that it's created before you're born and throughout your life.

But damage is not part of "metabolism."

this is a useful fact

because you can redraw the diagram like this

Let me explain the difference between gerontology and gerontology.

Now let me explain what I mean by "damage" in strictly biological terms.

Geriatricians, on the other hand, try to turn back time by stopping damage from turning into disease.

But the reason this is all a losing battle is because the damage continues to accumulate.

There's a third approach, if you look at it like this:

You could call it an "engineering approach." I would say that an engineering approach is possible.

Engineering approaches do not interfere with the aging process.

It doesn't interfere with either aging process.

The good thing about this is that it's not a losing battle, because we have it within reach, because it's nothing to do with improving the evolutionary process of organisms.

The engineering approach says, "Repair all kinds of damage on a regular basis. You don't have to completely repair it, but as much as you can, keep it below the damage threshold. Keep it below the damage threshold."

We know that threshold exists, because we don't develop age-related illnesses until middle age, even though the damage continues to accumulate even before we're born.

Why can I say it's within reach

The point of this slide is shown at the bottom

I'll be here all night trying to argue which parts of metabolism are important to aging, because all of metabolism is, in some way, important to aging.

This list is illustrative and not complete

This list on the right is similarly incomplete

This is a list, just a small list, of the types of age-related illnesses.

But I would argue that the one in the middle is the complete list. It's a list of things that can be defined as damage that are, or could be, the by-products of "metabolism" that ultimately lead to disease.

That's just seven

These are categories, but there are only seven.

Cell loss, chromosomal mutations, mitochondrial mutations, etc.

First let me tell you why this list is complete.

Of course, a biological counterargument is possible.

what are we made of yes

made up of cells and intercellular substance

Where does the damage accumulate?

The answer lies in molecules that have been around for a long time. If a nascent molecule is damaged, it will be destroyed. If it's a protein, the damage goes away when it's degraded.

The problem must be molecules that have been around for a long time

These seven points have been debated among gerontologists a long time ago, and that's a good thing, because the fact that, despite 20 years of advances in biology, this list hasn't gotten any longer is pretty solid evidence that the list doesn't need to be any longer.

And what's even better is that we know how to fix all of them, and I'm talking about mice, and we'll be able to apply them in 10 years.

Some have already been partially applied, the one above.

I don't have much time to explain, but the bottom line is that, given the right amount of research funding, we can achieve "strong rejuvenation in mice" within 10 years, but we have to take it seriously.

first we need to start

Now, some of you in the audience are biologists, so I'd like to answer some questions that they might have.

You may be dissatisfied with the content of the lecture. Basically, you need to read the paper.

I've published a number of papers outlining in great detail the experimental work that underpins my optimism.

The detailed data give us confidence in the seemingly extreme timescales we foresee here.

If you think I'm wrong, please take a good look at my paper.

It's important not to trust people who call themselves gerontologists, because when something happens in a field that radically deviates from existing thinking, it's expected that mainstream people will resist and ignore it.

You need to do your own research to understand whether my story is true or not.

I'm going to finish my story, but I'd like to add a few things.

One is in the next session, and I'm going to listen to one of the speakers who once said that we can analyze the human genome in no time.

As you know the end

this kind of thing always happens

The Methuselah Mouse Award, for example, is a strategy to incentivize innovation and to get people to do what they think will work, and if it works, they'll get a cash prize.

There is also a proposal to create a research institute.

this is a little bit expensive

But how long do you think it will take to spend that money on the Iraq war?

it doesn't take that long

(Laughter) It should be based on love of humanity. Financial gain kills learning, but it's basically a 90 percent success rate.

we know what to do

thank you

(Applause) (CA) I don't know what questions you have, but I'd like to have some time for Q&A.

(Interviewer) You talked about trying to beat aging, but why does he look like an old man?

(Laughter) (AG) That's pretty old. 158 years old.

(Laughter) (Applause) (Interviewer) Life on Earth has an immune system that fights all kinds of diseases so that it can reach reproductive age.

But as far as I know, all organisms have evolved to die, and when cells divide, their telomeres shorten, and eventually they die.

So maybe evolution made a choice that didn't allow immortality. Is dying an advantage, or is evolution itself imperfect?

(AG) Thank you for your excellent, good question.

I'm going to answer your question in a purely mainstream way, which I happen to agree with. Aging is not the result of selection or evolution.

In other words, it's hard not to age. To age more slowly, we need more genetic pathways, more genetic sophistication, as well as longer lifespans.

To the extent that evolution is irrelevant, whether genes are inherited from individuals who have lived longer or are of reproductive age, there is some degree of genetic modification, which explains why different species have different lifespans and why there are no immortal species.

(CA) We don't care about genes, but it's a big problem for us.

(AG) Exactly

Q: I read somewhere that over the last 20 years, the average human life expectancy has increased by 10 years around the world.

So I'm thinking, unless I'm in a motorcycle accident, I'll live to be like 120.

Am I the only one who can live to be 1000 years old?

(AG) If I lose a little weight

(Laughter) Your numbers are a little off.

Generally speaking, life expectancy increases by about 1-2 years every 10 years.

so it's not as expected

But I'd like to increase this number by one year each year.

Questioner: I've heard that adult brain cells are formed in the fetus, and brain cells have a lifespan of 80 years or so.

And if that's true, do you think it would affect rejuvenation in a biological sense?

Where normal cells live only a few months, what would happen if you had a cell that could live for 80 years?

(AG) There will certainly be technical implications

In some parts of the brain, where cells are slowly disappearing, you basically need to replace cells, especially neurons, because you don't want to replace them too quickly because if you do it too quickly, you'll lose cognitive function.

I said earlier that there is no seed that doesn't age, but I think that's a bit of an oversimplification.

There are species that don't age, like the hydra, but the hydra doesn't have a nervous system.

Wellawatta, an upscale residential area in Colombo

We were standing on the railroad tracks that ran between a friend's house and the beach

The track is usually raised about 2.5 meters above the water surface, but at that time the tide level had dropped about 1 meter.

I saw the coral there for the first time

Fish were left behind in the tide pool due to the ebb tide

the kids jumped in there

I was trying to catch a fish in a bag

No one knows that it will bring disaster...

People standing on the railroad tracks just stared at them

When I was about to go back to my friend's house

someone shouted

Then everyone ran away screaming at full speed.

The tide came back, slamming into the coral

The kids managed to get back to the tracks

the waves keep coming

Two minutes later we were on the railroad track and over it, at this point we had run 100 meters.

the waves still rush

An old man is submerged in water up to his knees but does not escape

He shouted, "I've lived here all my life. I'd rather die than run away!"

The boy shook his mother off and ran to the rescue of his frightened dog.

The old woman is held by her son and runs away from home

The slums between the sea and the train tracks were completely swept away by the waves.

Warnings had been issued to residents in the danger zone, and no one was late in escaping.

I didn't have time to run away with my luggage

A few hours later, the debris from the slums was scattered all over the place along with the seawater.

When the water receded, there was no trace left

It might be hard to believe if you haven't seen a lot of news, but after the tsunami, in many places, people were still afraid.

The once calm sea suddenly swallows up people, houses and even boats, and no one knows if another tsunami will come.

The terror of that tsunami must be that there was no information at all.

It seems like a small thing, but the next tsunami will hit exactly at 1:00 p.m.

I don't even know if it's safe to take a boat to go to the hospital.

phi phi hospital would have been hit by the wave

This boat will go to Phuket Hospital, but if it's too dangerous to dock, it'll go to Krabi instead, which is safer.

Because the next tsunami won't come soon

At the Phi Fai Hill Resort I was shoved into a corner far from the TV, but I listened for information from the TV.

According to the information, there was an 8.5-magnitude earthquake in Sumatra, which caused that massive tsunami.

The news gave us some peace of mind knowing what had happened.

But it was all about what happened, and I didn't know what would happen in the future.

It's all just rumors, and I've spent over 36 hours asking around, and no one knows for sure.

I introduced the state of the tsunami from the blog that surged after the Asian tsunami.

I'm going to show you two videos of the tsunami that were introduced on the blog.

pretty shocking

Footage from Thailand and also footage from Phuket.

(shouting) VOICE 1: Come on! I will come again!

VOICE 2: Again? !

VOICE 1: Oh here we come again!

Voice 2: Let's go inside!

VOICE 1: Another wave! VOICE 2: Again!

Voice 1: Yes! The next wave is coming!

(shouting) There's still people out there!

It was a video on this site waveofdestruction.org

The world of blogging changed a lot before and after the tsunami, and what happened in the wake of the tsunami was that at first -- on the first day, there were no live reports or videos on blogs, but that's why.

Some complained, "I'm disappointed in the blog."

After a couple of days, it became clear to me that there was a flood of information, a powerful picture of everything that had happened, something that had never happened before.

It was done by a disjointed, virtually unorganized group of writers, video bloggers, and others who, by accumulating information, created a picture of the scene of this disaster that was much more comprehensible than the information in the mainstream media.

So you could say that the tsunami was a historic moment when blogging really started to come into its own.

Now let's move on from this lofty, if you will, majestic and terrifying subject, to something more familiar.

When most people think of blogging, the first thing that comes to mind is politics, technology, etc.

So, in the remaining 10 minutes, I'd like to ask you three questions about the blogging world.

The first is what blogs tell us about what drives people to act.

Second, does blogging really have the potential to reach hitherto untapped collective intelligence?

Third, the potential problem with blogs, what are the problems with blogs?

So the first question is about what motivates people to act.

What you can learn from blogs, especially in the blog world, and more broadly on the Internet, what's fascinating -- something that may seem obvious, but I think it's important -- is that people building websites, linking, commenting, and posting so much content every day do it basically for free.

People don't get anything in return other than getting attention and recognition for their good work.

This is surprising, at least from the point of view of traditional economists. The traditional view is that, fundamentally, humans work economically for a definite reward: money.

But when you look at the Internet, it's amazing to see that people have found a way to work together that doesn't have to do with money.

New ways of organizing activities are being created.

Yale Law School's Yokai Benkler, in his paper, "The Penguins of Ronald Coase," describes the well-known open-source model of Linux as applicable to any situation.

Remember that tsunami? There were a lot of journalists everywhere, and they wrote tons of articles just because they wanted to tell their stories.

It's a big, powerful truth.

This shows that in the future, it could be interesting to organize this mass activity.

So what the blogosphere is showing us is that either we're going to extend what we thought was rational, and we're either going to extend the value of things = money equation, or we're going to keep paying money all the time.

A very small number of people -- maybe 20 -- are making money in some way, and a few are trying to make a living out of it, but most of them are just doing it because they like it, because they want attention.

Howard Rheingold has a lot to say about this, and he says that voluntary cooperation is incredibly powerful and something to think about.

The second question is, what role does the blogosphere really play in accessing collective intelligence?

Chris introduced me to my book "Everybody's Opinion Is Surprisingly Right"

The premise is that under the right conditions, groups can display remarkable intelligence.

You can often be smarter than the smartest person in the group.

As a simple example, let's say you want a group to guess how many jelly beans are in a jar.

I have that bottle and I ask people how many they have in it, and the average is pretty close to being correct.

It's probably in the range of 3-5% of correct answers, and the average is better than 90-95% of the answers.

One or two people may come up with pretty good numbers, but the group's answer will be closer to the correct answer than your answer.

And the amazing thing is that this phenomenon works in more complex situations as well.

For example, if you look at the odds in horse racing, you're almost perfectly predictable.

A group of tipsters are kind of predicting the future in terms of possibilities.

Google and others rely essentially on the collective intelligence of the web to find the most useful sites. Google is doing impossibly well because collectively, the "world-wide-web" chaos actually contains greater order, or greater intelligence.

And I think there is such a prospect in the blog world.

Dan Gilmore, in his book "Blogging: The Personal Media That Will Change the World," said, "The reader is more knowledgeable than I am."

This is a very challenging idea, a very challenging one for the mainstream media, a very challenging idea for anyone who has devoted a great deal of time and expertise, who has devoted a lot of energy to their profession.

But what the world of blogging offers is the potential for collective, pervasive intelligence, and if we can access it, our intelligence is available to everyone.

Individual blogs and comments may be a little different than what we're looking for, but their collective insights are often very interesting and valuable.

That's the beauty of the blog world.

Sometimes it's called participatory journalism, citizen journalism, and so on, and in fact, people who were previously silent will speak up, and we'll have access to pre-existing but unused information at our fingertips.

But there's also a problem with this, and I'll spend the rest of my time talking to you.

When you start spending a lot of time on the Internet and you become so preoccupied with things on the Internet, you can fall in love with the Internet itself.

It's easy to fall in love with its bottom-up, decentralized nature.

I think that it is inevitably a wonderful thing.

although in many cases it is

That's the problem with the blogging world: the more connected we are, the harder it is to remain independent.

One of the fundamental qualities of networking is that once you connect, it creates your perspective and shapes your relationships with other people.

A network is also defined as

Not just a collection of partial parts

have more meaning

Steve Johnson calls this the emergent phenomenon.

It helps in the following ways: it contributes to the efficiency of information exchange, it allows you to reach out to a large number of people, and it also helps people to work together.

The problem is that in order for groups to make smart decisions, their individual independence must be preserved.

This becomes a paradox of "everybody's opinion" and collective intelligence, but what we really need is independent thinking.

Networks make it difficult, because thinking is affected.

Now, what's notable in the blogosphere is that once a meme -- an idea -- is in motion, it's very easy to accumulate it because of links from other people.

When someone links, others link to it

And it's this stacking of links that is the nature of the blogging world, especially when it comes to politics, that inevitably precludes this wonderful decentralized, bottom-up intelligence that blogging can exhibit under the right circumstances.

I often use the walking mill analogy

Many people cite ants as an example.

bottom up

When we think of distributed phenomena, the ant nest is a classic example, because even though individual ants may be unconscious, collectively they'll make smart choices.

You can quickly direct traffic so that you can get to your food as quickly as possible.

So the ant's nest is a good model.

But sometimes they get lost, and even worse, when a soldier ant gets lost, they follow the basic rules and just imitate the ant in front of them.

Then the ants gradually begin to draw circles

In one case, they marched 360 meters in a circle for two days, just until they died.

and this is what we are concerned with

You have to be careful not to march like ants to death.

With that in mind, going back to the tsunami, what's amazing about the tsunami story is that it's not so much about the tsunami itself, it's about the influence of the blogosphere, but it's a strong depiction of the bottom-up phenomenon.

Concentrated access to sites that did not exist before

You can express your own thoughts that you have never expressed before in a way you never have before.

You've certainly seen the intelligence of the web

This is a great point. Infinite loops are a bad example.

I think we should focus on great things

thank you

I'm Dennis Frohman. Listen to my poem "Accent."

Mama holds her accent like a shotgun With those firm hands

Mama's tongue with brass knuckles Slips between her lips Mama's hips are draped in laughter and wind noise

Mom speaks Spanish and English jjampon They're talking fast and pushing each other I can't tell my mom to shut up She doesn't know how to shut up

Your mother's voice is both big and small Don't tell me to be quiet Mama's been waiting so long for her voice to speak I can't let it go

English remixed in mom's mouth Strawberry becomes eh-strawbeddy Cookie becomes eh-cookie Kitchen and keychain and chicken are indistinguishable

Mother doesn't say yes, she says aha The sky in her mouth suddenly becomes a Héctor Laveau song

Mom's tongue can't be smooth enough to match English Too much bone Too much conga Too much quattro for two-step Too many piano keys between teeth Too many claves Too much clapping Too much salsa to sit still Like a child who wants to make clay out of concrete English is too neat for your mother's beauty

Your mother's words are all you've got in your hands It's all too common to say it's all you've got in your hands Yet the accent reminds us that we're still bomba Still plena When you say wepa, others become hermano When you say dale, the crowd becomes a gathering of relatives

Mama's tongue is adorned with el campo coqui (frog) in telegrams from Mama, so Mama's lips may not grow to match the English language, but her accent is a stubborn compass, always pointing her home.

(music) (applause) Thanks for coming.

'Cause I've spent 17 years in silence

It wasn't until the 20th anniversary of Earth Day in Washington, D.C., that I spoke for the first time since then.

All my family and friends came to listen to me

And I said, "Thank you for coming."

My mother, who was in the audience, jumped up and said, "Oh my gosh, Johnny is talking!"

(Laughter) Imagine what would happen if you didn't speak for 17 years and your mother was in the audience.

My father said, "That's one-" I'll explain later.

But I looked elsewhere, I didn't know where my voice was coming from

I hadn't heard my voice in 17 years, so I turned around and said, "Who's voicing my thoughts?"

And I knew it was me, so it was kind of funny.

Then I saw my father - he said, "He's really going crazy."

let me tell you about my journey

I think my journey can be compared to any other journey.

So what I've done is certainly unusual, but I want you to think about your own journey.

My journey began in 1971 when I saw two tankers collide under the Golden Gate Bridge and half a million gallons of oil spilled into the Gulf.

I was so confused that I decided not to ride any cars or buses or anything like that.

that's a big deal in california

In my small community of Point Reyes Station in Inverness, California, it was a big deal, because in the winter, it was about 350 people -- it was 1971.

So when I came in and started walking around, people knew what was going on.

They drive up to me and say, "John, what are you doing?"

I replied, "I'm walking to save the environment."

And they said, "No, it's to make us look ugly,

They're walking to annoy us."

Perhaps that was true in a way, because I thought that if I started walking, they would follow me.

Everyone was talking about environmental pollution because there was an oil spill.

And I had a lot of arguments with people about it.

call your parents

"I stopped riding and driving," he said.

My father said, "Why didn't you do that when you were 16?"

(Laughter) I didn't know the environment at the time.

my parents were in philadelphia

I said to my mother, "But I'm really happy."

My mother replied, "If you're happy, you don't have to say it."

mothers are like that

Then, on my 27th birthday, I made the decision We've had so many discussions, we've talked so much, let's stop talking Let's just take one day off

ran it

I woke up in the morning and didn't say anything

I must say it was a very moving experience.For the first time in many years I started listening.

What I heard confused me

What I used to do when I thought I was listening was listening until I could hear what other people were saying, and when I thought I knew what they were talking about, I stopped listening.

And in my mind I was anticipating the words I would say while people were still speaking

Then I was rambling

It just ended the communication.

So on this first day I really listened

And it made me sad because I realized something I hadn't learned in all those years.

I'm 27 and thought I knew everything

it was a big difference

So I thought I'd keep listening for one more day, and then another day, and another day, and finally I decided to stay silent for a year, because I learned more by listening, and I had to learn more.

Let's not talk for a year, and on my next birthday, I'll review what I've learned, and then I thought I'd start talking again.

it lasted 17 years

During those 17 years, I walked, I played the banjo, I drew, I kept a journal, I read and tried to learn about the environment.

I decided to go to school and did it

I walked to Ashland, Oregon, because there was a school with a degree course in environmental studies.

was only 500 miles

Go to the student affairs - What, what, what?

i had a newspaper clipping

Do you really want to go to this school?

Could it be...?

I have a special program for you

In the next two years, I graduated with my first degree - a bachelor's degree.

my father came and i was very happy

My father said, "I'm so proud of you, but what are you going to do with that degree?

You don't drive, you don't talk, that's what you have to do."

(Laughter) I shrugged my shoulders, picked up my backpack again, and started walking.

We walked all the way to Port Townsend, Washington, where we built a wooden boat and sailed across Puget Sound, across Washington, through Idaho, to Missoula, Montana.

Two years before that, I wrote to the University of Montana, telling them I wanted to go to college.

I said that I would go there in about two years.

(Laughter) Two years later, I was there, and the people at the university -- I'm telling this story because they really helped me.

I have to tell you two things about Montana.

First, I had no money at all - I used this gesture many times.

People at the university told me, "Don't worry about that."

The department director said, "Come again tomorrow."

He gave me $150 and said, "Register for one unit.

Are you going to South America? ' said

I answered - rivers, lakes, hydraulic systems, South America

That's why I registered

The director came back and said, "OK, John. You've registered for one credit, so you have the keys to your office, you're eligible for college -- you're eligible, so you can use the library."

We are going to get all professors to approve your participation in the class.

They'll keep track of your grades, and if you can find a way to raise the rest of your tuition, you can enroll in that class and you'll get your grades."

They don't usually do that in graduate school.

I told this story because they really wanted to help me.

They saw that I was really interested in the environment, and they tried to help me.

At that time I was teaching in class without speaking

When I first entered the classroom, there were 13 students.

With the help of a friend who translated my gestures, I explained that my name was John Francis, that I had traveled the world, that I was speechless, and that this was the last time my friend would translate here.

The students were all seated, but they were stunned-

(Laughter) I could see them looking at the timetable to see when they would be able to get out.

they had to take that class with me

After two weeks, everyone tried to enter our class.

I learned a lot in that class - when I do

All the students gathered together, what is the teacher trying to say?

I don't know, he's talking about clearcutting the forest Yes, clearcutting

No, that's not clear-cutting. You're using a manual saw.

That's right, you can't clear cut

no, you can

No, I think you're talking about selective management of forests.

It was a discussion class and we were having a discussion

I withdrew from the discussion, just trying not to get into a brawl.

What I learned was that sometimes when I gestured, the students would talk about things I never intended to do but should have done.

If you're a teacher and you're not learning when you're teaching, you're probably not teaching very well.

i spent it that way

My father came over to see me graduate, and of course I hosted him. He said, ``I'm really proud of you, but-'' You know what happened.

What are you going to do with your master's degree? "said

I shrugged my shoulders, grabbed my backpack, and went to the University of Wisconsin.

I spent two years there writing a paper on oil spills.

no one was interested in that

But then this incident happened - the Exxon Valdez oil spill.

I was the only one in America studying oil spills.

father came again

"Son I don't know how you're going You don't get in the car, you don't talk

My sister tells me to leave you alone because you seem to be doing much better when you don't say anything."

(laughter) I put on my rucksack again,

I took my banjo and walked all the way to the East Coast and put my feet in the Atlantic - it took me seven years and one day to walk across America.

And then on Earth Day in 1990, on the 20th anniversary of Earth Day, I started speaking.

I said, "Thank you for coming."

Because, like a falling tree in a forest, if no one hears it, you can't be sure it's really made a noise.

I thank you and my family for coming to listen to me.

that is communication

They also taught me about listening - because they listened to me

That's what was born out of silence: listening to each other.

It's really, really important - we have to listen to each other

my journey continued

My father said, "That's one." But I didn't let him go further.

I worked in the Coast Guard and became a United Nations Goodwill Ambassador

I wrote a regulation for the United States, a regulation for oil spills.

Twenty years ago, if someone asked me, "John, do you really want to make a difference?"

I would have answered, "Yes, I want to make a difference."

He says, "Just start walking east. Get out of the car and just walk east."

And after I've walked a short distance, he says again, "Yes, stop talking, too."

(Laughter) "You can make a difference."

Why? Why?

How could something as simple as walking or not speaking make a difference?

My days in the Coast Guard were really good

And after that - I only worked for one year - I thought, "Enough, one year is enough to do this."

I got on a yacht, went down to the Caribbean, roamed all the islands, went to Venezuela

Yes, I forgot the most important thing, which is why I started talking, and I have to say that.

I started talking because I learned about the environment.

I learned the environment on a formal level, but there was also an informal level.

And on that informal level - I learned about people and what they do and how they do it.

And the environment changed from just being about trees and birds and endangered species to how we treated each other.

If we are the environment, all we have to do is look around and see how we treat ourselves and each other.

that's my message

I had to pass on the message

So I got on a yacht and sailed all the way across the Caribbean - it wasn't my yacht, I was working there - and I started walking around Venezuela.

Now let's get to the last part of my story, how I got here, because I still don't drive.

I've been walking through Eldorado, Venezuela - a famous prison town and notorious place - I don't know what made me do it, it was like I wasn't