We spend $50 billion on vegetables, so we need every diet aid.

We currently spend $200 billion annually on diet-related illnesses, and 9% of children have type 2 diabetes.

200 billion.

In other words, do we need another 8 billion? It's not that much.

This 8 billion equals 2 dollars and 49 cents. This is the amount the government allocates for lunch.

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

That means we spend less than $1 a day on food for school kids, or 80 to 90 cents in most schools. 56 cents in LA.

That means less than $1 spent on lunch.

I don't know about you, but I go to Starbucks, Pete's, etc. San Francisco ventilates are $5.

One cup of gourmet coffee and one more. We spend more money at school than we do to feed our children for a week.

you know what? we should be ashamed

We should be ashamed of that as a country.

richest country.

In our country, it is the children who need it most who are fed really, really bad food.

The people who get this food are children with parents, grandparents, uncles and aunts who can't even afford school lunches.

And they are the same children who get sick.

They are the same children we should take care of.

We can all make a difference.

Whether we have children, whether we care about them, whether we have nieces and nephews, that each of us can make a difference.

Whether it's sitting down to eat with your kids, taking your kids and grandchildren, or taking your niece or nephew to the farmers market. Just have a tasting with them.

Sit down and take care of yourself.

And on a macro level, we're in the middle of a 19-month-long presidential campaign, and among the things we're asking all these potential leaders, how about asking the health of our children?

thank you.

Hi. I am here to talk about the importance of admiration, admiration and gratitude, and the importance of it being specific and genuine.

And what sparked my interest in this is when I became an adult, and until a few years ago, I realized that although I wanted to say thank you, praise, and receive praise from others, I had stopped doing so.

And I asked myself, why?

It was embarrassing, embarrassing.

And my question is, am I the only one doing this?

So I decided to check it out.

I was lucky enough to work in a rehab facility so I get to meet people who are facing life and death from addiction.

And sometimes it boils down to the simple fact that their core wound is that their father died without saying a word that he was proud of them.

But then I hear from all the family and friends that the father told others he was proud of him, but never told his son.

That's because I didn't know my son needed to hear it.

So my question is, why don't you ask for what you need?

I know a gentleman who has been married for 25 years who wants to hear from his wife, "Thank you for being the breadwinner for the family so we can stay home with the kids," but doesn't want it.

I know a woman who is good at this.

She sees her husband once a week and says, "I really want him to thank me for everything I've done at home and with my children."

And he said, "Oh, this is great, this is great."

And although the praise should be heartfelt, she takes responsibility for it.

And April, my friend from kindergarten, thanks the kids for doing the housework.

And she said, "They should be grateful, why am I not?"

So the question is, why did it block?

Why did other people block it?

Why can I say, "I'll eat my steak medium rare and I need a size 6 shoe," but I can't say, "Will you compliment me like this?"

Because it provides you with important data about me.

I'm talking about where I'm worried.

It tells you where your help is needed.

And I treat you, my entourage, like enemies.

What can you do with that data?

You can ignore me.

It can be abused.

Or maybe it actually serves my needs.

And I took my bike to a bike shop and I love this bike and I took the same bike and they did what they call "truing" the wheels.

The man said, "I find the bike is much better when I tune the wheels."

When I got the same bike back, they removed all the minor warps from the same wheels I had for 2 1/2 years and my bike was like new.

So, let's all try it.

I want you to put your wheels right, that is, be honest about the praise you need to hear.

What do you need to ask? Go back to your wife and ask her what she needs.

Go back to your husband -- what does your husband need?

Go home and ask these questions to help those around you.

And it's simple.

And why should we care about this?

we talk about world peace.

How can we achieve world peace despite the existence of different cultures and different languages?

I think it starts with each household under the same roof.

Let's make one in our own backyard.

And I want to thank all the audience who have been wonderful husbands, wonderful mothers, friends, daughters and sons.

And maybe someone never told you that, but you did a really, really good job.

And thank you for being here, just showing up and changing the world with your ideas.

thank you.

(applause)

Well, I thought there would be a podium, so I'm kind of scared.

(Laughter) Chris asked me to tell him again how he found the structure of DNA.

And, as you know, I will obey his orders, so I will.

But it's kind of boring.

(Laughter.) And, you know, I wrote a book. So I'll say something -- (laughter) -- I'll tell you a little bit about how this discovery was made and why Francis and I found it.

And I'd like to spend at least five minutes talking about what I'm excited about right now.

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

I was a junior at the University of Chicago. The University of Chicago admitted me after two years of high school, so I was in my junior year.

In other words, graduating from high school was fun (laughs). Because I was very small and I wasn't good at sports or anything like that.

But I must tell you my background. As you know, my father was an Episcopalian and was raised a Republican, but after a year in college, he became an atheist and a Democrat.

(Laughter) My mother was Irish Catholic, but she didn't take religion too seriously.

When I turned 11, I stopped going to Sunday Mass and went birdwatching with my dad.

I got to know Charles Darwin early on.

You know, I think he was a great hero.

And, as you know, we understand that life is what exists now through evolution.

And I was majoring in zoology at the University of Chicago, and I figured if I was smart enough, I could eventually get a Ph.D. From Cornell University of Ornithology.

After that, a book review of the book "What is Life?" appeared in a Chicago newspaper. These are the words of the great physicist Schrödinger.

And of course that was the question I wanted to know.

Darwin described life as it began, but what is the essence of life?

And Schrödinger said that the essence is the information that exists in the chromosome, and that it must exist on the molecule. I had never thought about molecules before.

Chromosomes, as you know them, are molecules, and one way or another all information is supposed to exist in digital form. And then there was the big question of how they copied the information.

That was the book. From that moment on, I wanted to become a geneticist, to understand genes and through them life.

I mean, I had a hero far away.

It wasn't a baseball player. It was Linus Pauling.

So I applied to Caltech, but was turned down.

(Laughter) So I went to Indiana. Indiana was as good as Caltech in terms of genetics and had a really good basketball team on top of that. (Laughter) So I had a really, really happy life in Indiana.

At Indiana University, I got the impression that genes are likely to be DNA.

So when I get my PhD, I need to go look for DNA.

So I first went to Copenhagen thinking I might become a biochemist, but biochemistry turned out to be very boring.

It didn't go far enough to say what the genes were. It was just nuclear science. Oh, that's the book, the little book.

You can read it in about 2 hours.

And then I went to a conference in Italy.

And then there was an unexpected speaker who wasn't on the show, talking about DNA.

It was Maurice Wilkins. He trained as a physicist, wanted to do biophysics after the war, and chose DNA because it was determined at the Rockefeller Institute that DNA could be the genetic molecule on chromosomes.

Most people believed it was protein.

But Wilkins thought DNA was the best bet and showed him this x-ray.

some kind of crystal. Thus, DNA had a structure, albeit dependent on different molecules, possibly carrying different sets of instructions.

So there was something universal about the DNA molecule.

So I wanted to work with him, but he didn't want to be a former birdwatcher, so I ended up going to Cambridge, England.

So I went to Cambridge. It really was the best place in the world for X-ray crystallography. And X-ray crystallography is now a subject in the chemistry department.

So at that time it was the domain of physicists.

Therefore, the best place for X-ray crystallography was the Cavendish Laboratory in Cambridge.

And there I met Francis Crick.

I went there without knowing him. He was 35 and I was 23.

And we decided that within a day we might have a shortcut to discovering the structure of DNA.

Build a model, an electrical model, using coordinates such as lengths from radiographs, rather than solving in a rigorous manner.

But think what that molecule is. How should it be folded?

And the reason for doing so is Linus Pauling in the center of this photo. About half a year ago, he proposed an α-helical structure for proteins. In doing so, he ousted a right-wing man, Sir Lawrence Bragg, who was Professor Cavendish.

Here's a picture of Bragg smiling years later.

He certainly wasn't smiling when I got there. Because he felt somewhat humiliated that Pauling had taken the alpha-helix and that the Cambridge people had failed because they were not chemists.

And sure enough, neither Crick nor I were chemists, so we tried to build a model. And he knew, Francis knew Wilkins.

Wilkins then said he thought it was the spiral.

X-rays, he thought, were comparable to spirals.

Therefore, we constructed a three-strand model.

People came from London.

Wilkins and this collaborator, or potential collaborator, Rosalind Franklin, showed up and kind of laughed at our model.

They said it was terrible and it was true.

So I was told not to build any more models. we were incompetent.

(Laughter) So we didn't build the model, and Francis continued working on proteins.

And basically, I did nothing. And -- except reading.

Basically, reading is good. I get the facts.

And we kept telling people in London that Linus Pauling was going to do DNA research.

If DNA was that important, Linus would know it.

He would build a model and then we would be scooped.

And in fact, he was writing to people in London asking, "Can you look at their X-rays?"

And they had the wisdom to say "no." So he didn't have it.

But there was such a thing in the literature.

In fact, Linus didn't look at them all that carefully.

But about 15 months after I came to Cambridge, rumors began circulating from Linus Pauling's son at Cambridge that his father was now working on DNA.

So one day Peter came in, said he was Peter Pauling, and gave me a copy of his father's manuscript.

Besides, we were afraid that we might be scooped.

I have nothing to do and I have no qualifications.

(Laughter) So we had a paper and he proposed a triplex structure.

And then I read it, and it was just crap.

(Laughter) This was, as you know, globally unexpected -- (Laughter) -- so they were held together by hydrogen bonding between the phosphate groups.

Well, if the cell's peak pH is around 7, those hydrogen bonds can't exist.

We rushed to the chemistry department and said, "Is Pauling right?" Alex Hust replied, "No." So we were happy.

(Laughter) And, you know, we were still in the game, and I was afraid someone at Caltech was going to tell Linus he was wrong.

So Mr. Bragg said, "Build a model."

A month after receiving Pauling's manuscript, I should say I took it to London and showed it to people.

Well, I said Linus was wrong, we're still in the game, and we need to start building the model soon.

But Mr. Wilkins said "no." Rosalind Franklin is due to retire in about two months, and he started building his model after she retired.

So when I came back to Cambridge with the news, Bragg said, "Build a model."

Well, of course I wanted to make a model.

There is also a picture of Rosalind. She really, you know, was in a sense a chemist, but she should have actually been trained. She knew nothing of organic or quantum chemistry.

She was a crystallographer.

And I think part of the reason she didn't want to model was because Pauling was a chemist, and she wasn't.

So Crick and I started building models, and I learned a little chemistry, but not enough.

Well, the answer was given on February 28, 53.

And it was because of the rules that to me are very good rules. They say, "Don't be the brightest person in the room," but we weren't.

We weren't the best chemists in the room.

I went and showed them the pairings I had made, and Jerry Donahue -- he was a chemist -- said it was wrong.

The hydrogen atom is in the wrong place.

I just put it in the same way as it was in the book.

He said they were wrong.

So the next day I thought, "Well, he might be right."

So I changed places and found a base pair. Francis quickly said that the chain is running in an absolute direction.

And we knew we were right.

It was amazing, everything happened in about 2 hours.

From nothing to existence.

And we knew this was a big one because we could just put A next to T and G next to C and we would have a copy mechanism.

We therefore investigated how genetic information is transmitted.

The order of the four bases.

In a sense, it is digital information.

and copy it from the strand separation.

I mean, even if it didn't work out this way, you better believe it because you didn't have other plans.

(Laughter) But most scientists don't think so.

Most scientists are actually pretty dull.

They said they wouldn't think about it until they knew it was right.

But you know, we thought it was at least ninety-five percent, or ninety-nine percent correct.

So let's think about it. Over the next five years, there were basically five mentions of our work in Nature, but none.

So we were left alone trying to do the last part of the trio. How and what does this genetic information do?

It was clear that it provided information to the RNA molecule. So how does it change from RNA to protein?

For about three years we tried to figure out the structure of RNA.

It didn't give in. X-rays were not very good.

I was clearly unhappy. The girl didn't marry me.

It was really the worst of times.

(Laughs) I still have pictures of Frances and me before we met that girl, and I still look happy.

(Laughter) But there's one thing we did when we didn't know where to go. We formed a club and named it "RNA Tie Club".

The necktie was designed by the great physicist George Gamov.

he was one of the members. The problem was how to go from the 4-letter code for the protein to the 20-letter code.

Feynman, Teller, and Gamow's friends were members.

But I was only photographed twice.

And in both cases, you know, one of us took off the tie.

Francis is in the upper right, and Alex Rich, MD-turned-crystallographer, is next to me.

This was taken in Cambridge in September 1955.

And I'm smiling, kind of forced, I guess, because the girl I had, boy, she's gone.

(Laughter) So I wasn't very happy until 1960. Because it turns out that there are basically three forms of RNA.

Fundamentally, we knew that DNA provided information to RNA.

RNA provides information to proteins.

So Marshall Nirenberg took RNA, synthetic RNA, and put it into the system that makes proteins. He made polyphenylalanine, polyphenylalanine. This was the first decipherment of the genetic code, all completed by 1966.

So that was what Chris wanted me to do, that was it, so what happened since then?

Well, then--you should go back.

When I learned the structure of DNA, I gave my first talk at Cold Spring Harbor. Physicist Leo Szilard, he looked at me and said, "Are you going to patent this?"

And, though, he knew patent law and knew we couldn't get a patent because you couldn't. it doesn't help.

(Laughter) So DNA wasn't going to be a useful molecule, and it wasn't until 20 years later, in 1973, when lawyers got involved in this problem, that Boyer and Cohen from San Francisco and Stanford came up with the recombinant DNA method, and Stanford patented it and made a lot of money.

At least they patented something that could be useful.

And I learned how to read the letters of the code.

And then, you know, we had the biotech industry. And, you know, though, it was still a long way from answering the kind of question that dominated my childhood: "How do you nurture nature?"

So I continue. I'm running out of time, but this is Michael Wigler. A very, very clever mathematician turned physicist. And he developed a technique that basically allowed him to look at a sample of DNA and eventually a million spots along it.

It has a conventional chip in it. Then there's something photolithographically made by a Madison company called NimbleGen, which is far more advanced than Affymetrix.

And we use their technology.

And what you can do is compare the DNA of the normal and cancerous segments.

And at the top you can see insertions or deletions in cancers that are bad cancers.

So the DNA is terribly dirty, but if there is any chance of survival, the DNA is not so dirty.

So we believe this will eventually lead to what we call a "DNA biopsy". You need to see this technique in action and feel the enemy's face before undergoing cancer treatment.

It's only part of it, but I think it's going to be very useful.

So we started with breast cancer, there was a lot of money in breast cancer and no government money.

And now I have some kind of vested interest. That's what I want to do for prostate cancer. In other words, if it's not dangerous, you won't get treatment.

But Wigler didn't just look at cancer cells, he also looked at normal cells, and he made a really surprising observation.

In other words, we all have about 10 places in our genome where a gene has been lost or another gene has been added.

So we are all imperfect in some way. And the thing is, if we're here, these little losses and gains might not be so bad.

But if these deletions or amplifications happened in the wrong gene, perhaps we would feel bad.

The first disease he focused on was autism.

The reason we focused on autism was because we had the money to do it.

Personally, it's around $3,000. And parents of high-intelligence autistic children with Asperger's disease sent their jobs to traditional companies. they didn't do that.

We couldn't do that with conventional genetics, but we started finding the autism gene just by scanning it.

And as you can see here, there are a lot of them.

So many autistic children are autistic because they just lost a large piece of their DNA.

So it's a big part at the molecular level.

We observed autistic children with about 5 million bases missing from one of their chromosomes.

We haven't seen the parents yet, but maybe they don't have that sense of loss, or else they aren't parents.

Well, our autism research is just beginning. We got $3 million.

I think it will cost at least $10-$20 before we can help parents who have a child with autism, or who think they may have a child with autism, can you tell the difference?

So you should look at all this same technique.

A great way to find genes.

So I'd like to end by saying that I've studied 20 people with schizophrenia.

I figured I'd probably have to look at hundreds before I could take a picture. But as you can see, 7 out of 20 had very large changes.

Still, the controls had three.

So what is the meaning of control?

Were they mad, too, and we didn't know it?

Or were they normal? I think they are normal.

And there is a predisposing gene for schizophrenia, and what we think about whether it is a predisposing gene, is that only a portion of the population can get schizophrenia.

I have no real evidence, but the best guess is that left-handed people are more likely to develop schizophrenia.

Thirty percent of people with schizophrenia are left-handed, and schizophrenia has very interesting genetics, meaning that 60 percent of people are genetically left-handed, but only half of them showed that. I don't have time to say

Now, some people who consider themselves right-handed are genetically left-handed. OK. I mean, if you think, "I don't have the left-handedness gene, so my kids won't be at risk for schizophrenia." Maybe so. OK?

(Laughter.) So for me, it's a very exciting time.

We should be able to find the genes for bipolar disorder. There is a relationship.

If I have enough money, I should be able to find them all this year.

thank you.

I'm a toy designer, or was a toy designer, or something like that.

Before I became a toy designer, I was actually doing pantomime, street pantomime.

And I think I was an entertainer.

Before that, I was a silversmith, but even before that, I left home when I was about 15 and a half and never went to college.

It actually wasn't. It didn't make sense to me at the time.

That's what I do now after learning all things quantum.

(laughs) It's really cool.

Anyway, I thought I'd show you a little bit of the world of toy design, at least from my small view of the world.

This is a video I made when I started designing toys.

I build weird stuff in my garage.

And then I went to the toy company and there was this guy across the table who said, "Pass, pass, pass."

You'd think it would be really cool, but they'd-- anyway, I made this little tape and I show it every time I go in.

This is the name of my company, Giving Toys.

Actually, I used to work for Mattel.

After leaving Mattel, he started a hamburger maker and obtained a manufacturing license.

It's a hamburger maker, and you put peanut butter in it and stuff like that, but it's a french fries maker, and you can eat small, tiny pieces of food.

I threw up a pasta shop and made it.

Then I think this is a McNugget maker.

This is a mac nugget maker and this is where my eldest daughter is making mac apple pies.

And voila, make pie and cinnamon and sugar, then eat, eat, eat and you—she's about 300 pounds now.

No she's not, she's beautiful.

This is what they looked like when they finally came out.

These are like $15 million lines.

So I was able to get through some things. I didn't get any royalties from this, but I still managed to get through it.

Here's a summary.

It was a missile foam launcher that was never sold.

This is dizzying for no apparent reason.

This is part of the effect I created for "Wig, Rattle and Roll".

It was the eyes of the robot controlling the back.

That's why I paid one month's rent.

This is a walking Barbie. "Oh, that's it!" I said.

And they said, 'Oh, that's really great,' and it was over.

This is a combat robot. I thought everyone would want this.

They fight and they stand up, you know? Isn't this cool?

And they toyed with it and dropped it like a hot stone.

Very cool.

Here I am doing a flight test with my little pug to see if this really holds up.

it's pretty good.

It uses a small phone connector to allow it to rotate.

They have albums like that, but the kids don't know what it is.

This is a clay maker.

I went to Play-Doh and said, "Look, I can animate this."

They said, "Don't tell us about Play-Doh."

And I made a Lego animator.

I thought this would be so great!

Also, Lego, don't take Lego to Lego.

That's the answer. they know all about it.

Then I started doing animatronics.

I loved dinosaurs.

I was kind of in the movie business, and in fact Nicholas Negroponte saw this when I was about 12 and anyway, then they said, 'No, we have to make two and they have to fight.

See, why would a child want a dinosaur?

This is me using [unintelligible] or 3-D Studio in the 80's.

That's David Letterman.

You can see how old this is.

That's my youngest cousin.

It is a corner called "Dangerous toys that can not be seen at Christmas".

It had the first ever saw blade launcher and a flamethrower chair.

My career basically peaked here.

And in the back are foamcore cutouts of people who couldn't make it to the show.

This is MEK going through the wiper motor.

This is what I used to be like as an actor.

And I'm really not very good at it.

But this was a man named Dr. Yatz, who used to take toys apart and teach kids about engineering.

You can see the Nintendo of massively parallel processing there.

And the left side is the view master of the CD-ROM.

A man named Stan Reznikov did this as a pilot.

This is -- you can see a little window there.

You can actually see the bubbles at the bottom of the Steadicam.

I can see the keyboard strapped to my wrist.

Far ahead of my time here.

(Video) I'm getting dizzy...

Narrator: I love toys!

Caleb Chan: That's all I wanted to say there. I love toys.

OK, so it was the first kind of product. That was the first batch of product.

Most of them didn't go.

Win 1 in 20 and 1 in 30 products.

And sometimes we do things like automatic hair wrap machines that detangle the hair and pull out the scalp. And we will make some money with it. and put it out.

But eventually, we left Los Angeles and moved to Idaho, where it's actually peaceful and quiet.

And so I started working on this project -- oh I really need to talk about this very quickly.

I think there is a real correlation between innovation, art and science throughout making toys.

A kind of blending happens, and that's where innovation comes from.

And I tried to summarize this with some symbol that meant something to me anyway.

So I think there is a kind of dynamic balance between art and science, and that's where innovation happens.

And really, this is how I come up with great ideas.

But that's not really how you get leverage.

Actually, you should circle it and call it a business.

And when these three come together, I think we can make an impact in the world.

But move on.

So this is the simple story I'm going to tell. This is Furby's story.

As he said, I was the co-inventor of Furby.

I made bodies and creatures - well, you see.

So, by showing this, you can kind of understand what it's like to try to create a robotic lifeform or a technology that has an emotional connection with the user.

this is my family

This is wives Christie, Abby, Melissa, and now 17-year-old Emily, but she was just a problem child.

Alright, here comes that robot again.

Like I said, I came out of the film industry and said let's make an animatronic robot.

Let's make something like this.

So I've always been very interested in this.

This didn't really go anywhere, but my feet got wet from doing this.

This is a small one, and the torso moves a little.

A small little man walks by. More servo drives, lots of servo hacking, lots of mechanical stuff.

There is one more thing.

I think he actually has skeleton feet and wears them there.

Oh this is a little pony, a little pony. It's a very cute little one.

The purpose of exhibiting these is that I have always been interested in small artificial life creations.

So the challenge is: I worked at Microsoft for a short time, working on Microsoft Barney.

This is, you know, a bloated, purple dinosaur.

And I thought that there was a lot of things that I didn't need.

And Microsoft just has to fill its warehouse with this product and see if it sells.

I mean, it's a very strange business model compared to what comes from a toy company.

But anyway, my friend Dave Hampton and I decided to try and see if we could do it like a single-celled organism.

What is the smallest piece that can be used to make a tiny life form?

That's our little 30 cent Mabuchi motor.

So I have all of these design books, as many people think they have.

And throughout the book, this is Furby's first page. I have some kind of art and science.

Here's the reason, there's the way.

I try to put a lot of philosophy and a lot of thought into all of these projects.

Because they're not just "Bing" ideas. We need to dig really deep into these things.

Here's the actual pseudocode to get an idea of ​​the different types of drives etc.

And originally, the Furby only had two eyes and a few batteries in the bottom.

Then we said, 'You're going to feed him and he needs to talk,' and it got even more complicated.

Then we had to figure out how to use that one motor to move the eyes, move the ears, move the body, move the mouth.

And I want it to blink and do all this at the same time.

Well, with these cams and feedback, we came up with this kind of linear representation. And it worked pretty well.

Then it started to get a little more realistic and I have to start painting.

And at the top is my "note to myself": "Lots of engineering".

So it turned out to be a little less true than true.

Here is my first exploded view and all the small parts and small worm drives etc.

And we have to start making it, so this is the real deal.

I got up and cut my finger and started gluing things together.

And that's my little workshop.

And then there's the first little camera that powered the Furby.

And Half Shell has Furby.

You can see that the little BB inside the box is the tilt sensor.

I basically gnawed all of this out of plastic.

So he has a billion holes in the back of his head.

And there I am i'm done. I have my little Furby.

No, I think it's heroin or some kind of little robot.

(Laughter) And now I love little robots.

Then the wife says, "Well, you may like it, but you won't like it."

There she comes to help.

This is my wife Christie. He is, as you know, my muse and my eternal partner here.

And she paints, right?

she is a real artist.

And then she starts doing different drawings, color patterns and coloring books.

And I like the guy with the cigar at the bottom.

His test wasn't very good, but I like him.

And she started painting these other images.

At the time, "Beanie Babies" was a big hit, so we decided to do various works.

So here's a little pink kid with a little pouf on his head.

And this didn't work too well in our tests either. I do not know why.

My favorite is Damon Furby.

It was good.

Anyway, in the end we settled on this kind of look, a little puffy body and a bit of an imaginary character.

And there he is, a little bush baby there, caught in the headlights.

I actually went to Toys R Us and bought a little furry cat and ripped it apart to make this.

Since then, whenever I come home from Toys R Us with a doll or something, the doll disappears from my desk and is hidden in my house.

I have 3 girls and they are just like rescue animals they go there.

(Laughter) So the tether came off a little bit. This only controls Fur's mouth and eyes.

It's a bit of server control and I made a little video like "Hi my name is Furby, how are you". Then you can reach out.

He will, you can tickle him. I raised my hand and sold him by saying "ha ha ha ha ha".

And Hasbro actually said, referring to Tiger Electronics at the time, "Oh, we want to do this.

There's about 13 weeks until the Toy Fair, so I'm hiring you guys for that."

So Dave and I got to work.

It was mostly me because at this point everything was mechanic.

So now I really have to come up with all sorts of things that I don't know how to do.

And we started working with Solid Works and other groups throughout to make that happen.

And so we started. This was before SLAs really took off, not rapid prototyping.

We certainly didn't have the money to do this.

They paid me so little money to do this, so I had to call a friend of a friend who ran a prototype factory at GM, where the SLA factory had stopped.

And they said, "Yes, then we'll run it."

So they ran all the shells for us. It was great for them.

And a cam cut by Hewlett-Packard.

We went undercover for the weekend.

So you have a disk of files.

However, since it is a closed system, it cannot be printed by machine.

So I actually printed it out on transparent paper and taped it to the monitor.

And over the weekend I ran the parts for that.

Thus they come out nearing the end.

Then they looked like little Garfields.

Eight months later -- as you may remember, this -- was a total, total, total mess.

For a while, they were producing 2 million Furbys a month.

They actually ended up making about 40 million Furbys.

I can't believe how this could happen.

Hasbro made about $1.5 billion.

And I'll tell you a little bit about each.

So why do we do this?

why are you trying to do this?

And of course it's for your child.

And my youngest daughter is with Furby.

And she actually still has them.

So I feel kind of retired and we already live in Boise riverside paradise. So I started another company called Toy Innovation and did some projects with Mattel with a real woman here, Ivy Ross, made Miracle Moves Baby, was published in Wired magazine, and much more.

Then I started another company.

We created a small internet-connected handheld device for teens and won the "Best Innovation Award" at CES. But actually, I slowed down a bit and said, "Okay, I just...". After a while I had an old tape of this dinosaur and I gave it to this guy and other guys saw it and people wanted to do it.

And they said they would spend all this time.

So I said, "Okay, let's do this dinosaur project."

The crazy idea is to try to clone as many dinosaurs as possible using today's technology.

And it's not really, but it's as close to it as we can get.

And we really try to do this and try hard to make things that look as if they are alive.

It's not that kind of robot, but let's actually do it.

So I chose Camarasaurus. Because Camarasaurus was the most abundant sauropod in North America.

And you'll actually be able to find the perfect fossil evidence for these.

it's a boy

So I actually tried to enter.

There is a book called "Walking on Eggshells" that found actual sauropod skin in Patagonia.

And in the pictures that were in the book, I told the sculptor to use this bump pattern and use whatever you can copy it.

Very, very obsessive.

There's something like a truncated Camarasaurus skeleton, but the geometry is correct.

Then I went inside and measured all the shapes. Because I thought it was a biomimic.

If done well, it may work just like the real thing.

Then there is the motor.

And around this time, others are beginning to cooperate as well.

Here is an example using a skull.

There is a skull there and a picture of my skull.

There is such a thing as a skin version of soft tissue.

There is a mechanism to get in there, a kind of Geneva drive.

There are several Solid Works versions.

Here are some of the SLAs for the same:

And these are really crude pieces. We were just doing some testing here.

It has a skull with almost the same shape as Camarasaurus.

Behind the lens is a photorealistic eye.

And then there's the first exploded view, or something like a see-through view.

There's the first SLA version, and it already has the feel and kind of cuteness.

And the whole point of merging science and art in this interdisciplinary field is that you can build a robot, then go back and shape it, and then go back and forth.

The front leg servo had to be shaped like a muscle.

It had to fit inside the envelope.

It took a huge amount of work to get all of this working right.

The neck and tail are all cables and move smoothly and organically.

And of course, this is not the end.

You have to know what your skin looks like.

The skin is something else entirely and probably the most difficult part.

So we hire an artist to try to express the look and feel of the character.

Now this is different -- we're character designers, right?

And we're still trying to keep the real character.

So go back and cover the whole thing with clay.

Now start this sculpture.

And, as you can see, we had a guy who loves dinosaurs sculpt everything from spoon-shaped teeth to everything.

And sculpt more, sculpt more, sculpt more, sculpt more.

Four years and $10 million later, a tiny Pleo was born.

John, do you want to bring him up?

John Sosoka is our CTO and has done most of the work for the company of 40 employees.

I'd like to lend a hand to John. he will never be recognized. I'm John Sosoka.

(Applause) So, thank you, John, thank you, and get back to work, okay?

Okay -- (laughter) -- no, it hurts so much -- (laughter) -- this is a little pleo, you can probably see it.

I say this on purpose, they go through life stages.

So when you first get them, they're babies.

And you know, the more you have them, the older they get, the more they learn certain things through their actions.

So this, this is actually sleeping, and -- wait.

Pleo, wake up. Come on Pleo.

So this guy is listening to me here.

But they have 40 sensors all over their body.

They have 7 processors and 14 motors. But you don't care, do you?

It's just cute, right? That's the idea, that's the idea.

Look, hey, come on. Hey did you feel it?

There is something big and loud here.

oi.

(laughs) That's fine, get up, get up, get up.

Yes, they are like children.

you, yes, yes Well, he's hungry.

I'll show you what he's been up to for four years.

here, here, here. I have money, Pleo.

(laughs) Yes, please.

That's what investors think, and that's just -- (laughter) -- right, right. So they are really good kids.

And we believe that humans need to feel empathy for things in order to be more human.

And we think you can help with that by having a little critter you love.

Well, these aren't robots, they're kind of lovebots.

they change over time.

But most often they evoke feelings of compassion.

And here's a little something.

Now, what I mean is, as you know, Ugobe is not there yet.

we just opened the door. It is for all of you to step through.

It includes some that you may find useful.

I'm sorry, Pleo.

He has a USB, he has an SD card, so it's a completely open architecture.

So anyone can plug him in -- (applause) -- thank you.

This is John.

Anyone can get Pleo and completely redo his character.

You can make him bipolar, or like someone said -- (laughter) -- change his homeostatic urges, or whatever you want to call it.

Your child can add new sounds simply by dragging and dropping.

It is very difficult for us, as a matter of fact, to keep people from doing this.

There are animators who have taken commercials for Budweiser beer, and they say, 'Wow.

(Laughter) You, yes, yes, he likes it.

So they are a handful. Please get it.

I don't know what I'm missing, but the last thing I want to say is that if we continue down this path, we'll be designing our children's best friends.

And with that comes a lot of social responsibility.

That is why Pleo is soft, gentle and affectionate.

So I just hope we all have good dreams.

thank you.

(applause)

If you ask people what parts of psychology they find difficult, they say, "Well, what about thoughts and feelings?"

Most people would say, "Emotions are very difficult.

They are incredibly complicated. You can't do that -- I don't know how it works.

But the thinking is actually very simple. It's just some kind of logical reasoning or something.

But that's not where the difficulty lies. ”

So here is a list of issues that arise.

One good question is what do we do about our health?

I was reading something the other day that said handshakes are probably the single biggest cause of sickness in the West.

And then there was a bit of research on non-handshakers versus handshakers.

And I have no idea where to find people who don't shake hands. because they must be hiding.

And those who avoid it have 30 percent or so fewer infections.

Or maybe it was 31 and 1/4 percent.

So if you really want to solve a problem like an epidemic, start there. I've had to do hundreds of handshakes since coming up with that idea.

And I think the only way to avoid it is to get a visible and horrible disease, in which case I don't need to explain.

Education: How can we improve education?

Well, the only best way is to make them understand that what is being said is utter nonsense.

And, of course, you have to do something about how to soften it, so that everyone can—so they listen to you.

Pollution, energy scarcity, environmental diversity, poverty.

How can we create a stable society? longevity.

Well, there are many issues to worry about.

Anyway, the issues I think people should talk about are absolutely taboo. That's how many there should be.

And I think it should be about 100 million or maybe 500 million.

And notice that many of these problems are eliminated.

If 100 million people are decently distributed, when garbage is generated, if possible, throw it out of sight, and it will rot.

Alternatively, throwing it into the sea may benefit the fish.

The question is how many should we have?

And it's a kind of choice that we have to make.

Most people are about 60 inches tall or taller and have these cubic laws. So if you use nanotechnology to make it this big, you'll probably be able to -- (laughter) -- 1,000 times more.

That would solve the problem, but no one is doing research on making people smaller.

It's good that the population is declining now, but there are many people who want to have children.

And there is one solution that will probably be resolved within a few years.

Did you know that we have 46 chromosomes? If you're lucky, you'll get 23 from each parent. Sometimes you get one more, one less, but you can skip the grandparents and great-grandparents stages and go straight to the great-grandparents stage. There are 46 people, and if you give them a scanner or whatever they need, they'll look at your chromosomes and each will say who they like best, theirs or hers. There is no longer even a reason for having only two genders. So each child has 46 parents, and each group of 46 parents can have 15 children.

Isn't that enough? Then our children would be well supported, nurtured and mentored, the world population would be rapidly declining and everyone would be perfectly happy.

Time-sharing is a little further into the future.

And then there are the wonderful novels "Against Autumn at Night" and "Cities and Stars", twice written by Arthur Clarke.

Both are great and pretty much the same except computers came in between.

And Arthur looked at this old book and said, "Oh, that was wrong.

We will need computers in the future. ”

So, in that second version, there are 100 billion or 1 trillion people on the planet, and they're all stored on hard disks or floppies or whatever the future holds.

And release millions at once.

People go out and live a thousand years no matter what they do, and then a billion years, or a million years, forgot, but the numbers don't matter. But there really aren't that many humans on Earth at one time.

Then you start thinking about yourself and your memories, editing your memories, changing your personality, etc. before going back to a halt again.

The plot of the book is that the people who designed the city sometimes make it to create entirely new characters because the diversity isn't enough.

And in the novel, a specific person named Alvin is created. And he says that maybe this is not the best way and will break the whole system.

I don't think the solution I proposed is good enough or sensible enough.

I think the big problem is that we're not smart enough to figure out which of the problems we face are good enough.

Therefore, we need to build a super-intelligent machine like HAL.

As you remember, at some point in the 2001 book, HAL realizes that space is too big, too grand, too deep for really stupid astronauts. Contrast HAL's actions with the trivialities of the people on board the spaceship and you'll see what's written between the lines.

Well, what do you do about it? we can be smarter.

Compared to chimpanzees, I think humans are pretty smart, but they're not smart enough to deal with the gigantic problems we face: abstract mathematics, economics, and world balance.

So one thing we can do is live longer.

No one knows how hard it will be, but we will probably find out in a few years.

As you can see, there are two forks in the road. We know that humans live almost twice as long as chimpanzees, and no one lives past 120 years, but we don't really understand why.

But many people live to be 90 or 100 years old, as long as they don't shake hands too much.

So perhaps if we live 200 years, we will accumulate enough skills and knowledge to solve some problems.

That's one way.

And like I said, we don't know how hard it is. It may be so. After all, most other mammals live only half as long as chimpanzees, so humans have three-and-a-half or four times the lifespan of most mammals, or four times as long. And in the case of primates, we have almost the same genes. We differ from chimpanzees in our current state of knowledge by being sheer picky eaters, perhaps by only a few hundred genetic differences.

My guess is that gene counters still don't know what they're doing.

And whatever you do, never read about genetics or anything that was published while you were alive.

(Laughter) Just like in brain science, substances have very short half-lives.

So just by fixing four or five genes, we might be able to live to be 200 years old.

Or maybe 30 or 40 people, not hundreds.

So this is something that people and many ethicists debate -- you know, an ethicist is someone who thinks there's something wrong with what you have in your head.

(Laughter) And it's very difficult to find an ethicist who thinks any change is worth making.

And of course we are not responsible for the consequences of what we are doing now, right? As well as all this complaints about clones.

Still, two random people will mate and produce this child, and both of them have pretty rotten genes, and the child will most likely be an average one.

By chimpanzee standards, this is indeed very good.

Even if we live longer, we will have to face the problem of population growth anyway. This is because if humans live for 200 or 1,000 years, they can only give birth to a child approximately once every 200 or 1,000 years.

Then there will be no labor force.

One thing Laurie Garrett and others have pointed out is that a society without people of working age is in deep trouble. And the situation will get worse because there is no one to educate the children or feed the old.

And, of course, when I talk about long life, I don't want 200-year-olds to be the same as we imagine 200-year-olds to be actually 200-year-olds dead.

As you know, there are about 400 different parts of the brain, each of which seems to have a different function.

No one knows how most of them work in detail, but we do know that there are a lot of different things in there.

And they don't always work together. I like Freud's theory that most of them cancel each other out.

So if you think of yourself like a city with 100 resources, when you get scared, for example, you might abandon your long-term goals, but you'll be able to think deeply and focus on exactly how to achieve that specific goal.

Throw away everything else. You become a monomaniac. All you care about is not stepping on that platform.

And food becomes more appealing when you're hungry.

Therefore, I view emotions as a highly evolved subset of your abilities.

Emotions are not added to thoughts. Emotional state is what you normally get when you take away 100 or 200 of your available resources.

Therefore, thinking of emotions as the opposite of thoughts is very productive. And in the coming years, we hope to show that this will lead to smart machines.

And I think it's better to skip all this rest. This is more about how we make these smart machines -- (laughter) -- and the main idea is that really, at the core of any really smart machine is a machine that recognizes that it's facing some kind of problem.

Since this is this type of problem, there are methods and ideas that are appropriate for that problem.

So I think the main challenge for psychology going forward is to classify the types of predicaments, the types of situations, the types of disabilities, and the available and conceivable ways to think about them in combination.

So this is almost like Pavlov. We've lost the first 100 years of psychology to the really lame theory of how people learn to react to situations. What I mean is that after many levels, such as designing a huge messy system with thousands of ports, we finally come back to the central problem of psychology.

It's not what the situation is, but what are the types of problems and types of strategies, how do you learn them and how do you connect them, how do truly creative people invent new ways of thinking from available resources, and so on.

So, within the next 20 years, if we could get rid of all the traditional approaches to artificial intelligence—neural nets, genetic algorithms, rule-based systems—and raise our horizons a little higher, would we be able to create a system that could all be used for the right kinds of problems? Some problems are well suited for neural nets. Others, we know neural nets are hopeless against them.

Genetic algorithms are great for certain uses. I think I know what they're not good at, but I won't tell you.

(laughs) Thank you.

(applause)

good morning.

My name is David Rose.

Also, by pitching PowerPoint to VCs, I personally raised tens of millions of dollars from VCs through pitching PowerPoint.

And on the other side of the equation, I've personally overseen tens of millions of dollars in investments in companies pitched to me in PowerPoint presentations.

So it's safe to say that I know a little bit about the pitching process.

So the first question you need to understand is: What is the most important thing VCs are looking for when pitching a new business idea?

There are obviously all sorts of things: business models, finances, markets, this and that.

Overall, among the things you need to do, what is the most important thing a VC invests in?

who? what?

Audience: Everyone!

David Rose: Guys! you! That's it - you are that person.

So the goal of a VC pitch is to convince them that you are an entrepreneur who can invest their money and make a lot of money in return.

Now how do you do this?

You can't just walk in and say, "Hi, I'm a really good guy and a good boy. You invest in me." right?

So, halfway through the VC pitch, we only have a few minutes. Most VC pitches, angel pitches are around 15 minutes, but most should be less than 30 minutes. People's concentration starts to decline after 18 minutes.

Test shows.

So, in that 18, 10, 5 minutes, you have to convey a whole bunch of different traits, about 10 different traits, while you're standing there.

What is the most important thing you have to say? What?

AUDIENCE: Honesty.

DR: Oh, oh, oh, oh, oh!

It's a straight line, look at it!

Yes, sincerity. important thing.

I'd rather invest and take a chance on someone I know to be heterosexual than if there's a latent question of who they're eyeing and what's going on.

Therefore, the most important thing is honesty.

What is the second most important thing?

Let's see if we can get this.

Audience: Confidence.

DR: Close enough. passion.

right? Entrepreneurs, by definition, are people who leave something else to start and create new worlds and put their energies into it.

You have to communicate your passion.

If you aren't passionate, why should other people be? And why should you invest in your company if you're not passionate about it?

Additionally, there is a lot more to wrap up in this package to present to the VC.

Experience: You need to be able to say, "Hey, I've done this before."

"What we've done so far" is building a company, creating value, doing something from start to finish.

That's why venture capitalists like to fund serial entrepreneurs. Even if it didn't work out the first time, you've learned your lesson and will do better next time.

In addition to having experience starting a company or running something, it doesn't have to be a business, it can be an organization within your school or a non-profit organization.

However, the experience of creating an organization.

Next is knowledge.

If you say you're going to be a human genome map developer, you should know what the human genome is. I want you to acquire specialized knowledge.

I don't want people saying, "I just had a great idea in a business I know nothing about."

I don't know who the players are or what the market is like. ”

You have to know your market, your region.

And you must have the necessary skills to keep the company on track.

These skills include everything from technical skills for technology businesses to marketing, sales, management, and more.

But as you know, not everyone has all these skills.

Few people have all the necessary skills to run a company.

What else do you need? Okay, leadership.

You must be able to convince us that you have developed a team with all these elements. Otherwise it can be done.

And you have the charisma and management style, the ability to follow your lead, inspire people, and motivate them to be part of your team.

After all this stuff, what else would you like to know as a VC?

I want to know you have a commitment.

that you are here till the end

I want you to tell me, or tell me, that if you take your last breath, when you scratch your nails and are dragged out, you are going to die.

You will keep my money alive and make more out of it.

We don't want people who cut and run at the first opportunity.

Bad things happen.

No venture-backed company hasn't gone bad.

So know that you are working hard until the end.

It takes vision to see where this is going.

I don't want "me too" products anymore.

But in addition to that, I need realism. Because changing the world is great, but it doesn't always happen.

And bad things will happen before you change the world. you have to deal with it.

Finally, you are asking for my money. Not just because it's my money, but because it's me.

Must be able to coach.

We have been through a lot.

VCs and angels investing in you have experience and want to hear about your experience.

So how can you say these 10 things in 10 minutes without saying a word?

You can't say, "Invest in me because I have integrity!"

You have to do the whole pitch that conveys this without conveying it.

Think of your pitch as a timeline.

It starts, you enter the door.

they don't know anything about you

Every pitch, every sales presentation is emotional on some level.

You can go up, you can go down, right?

When you walk into the venue, the first thing you have to do is the overall flow of your presentation, and you have to start like a rocket.

It takes maybe 10 seconds (10-30 seconds depending on pitch length) to get their attention.

In my case, I invested.

I make millions of dollars selling PowerPoint.

"I invested millions." So it should arrive soon.

This may be true or counterintuitive.

It can be a story or an experience.

But within the first few seconds, you need to get their emotional attention focused on you.

And from there you have to take them on a very solid and steady upward path from start to finish.

All should reinforce this.

And then it got better and better, rev up until the end, and then boom! -- Kick them out of the park.

You want to get them emotionally high enough to be ready to write you a check or toss you money before they leave.

How do you do that?

Imagine backing up, skipping a step, and climbing stairs with missing treads or different heights.

stop it. You have to come up with a suitable and logical progression.

Let's start with what the market is. Why are you going to do X, Y, or Z?

And tell me how to do it and what to do.

And it should flow from beginning to end.

I must let you know that there is a touchstone for connecting with the rest of the world.

For example, reference companies you've heard of, or the basics of your business.

What I want to know is anything that I can relate to, i.e. a validator, or someone else has approved this, or anything that lets me know there is external validation.

It may be sales. You may have won an award. It could be that people have done it before. It's also possible that beta testing is going well.

I want to know validation. It's not just what you told me, it's that someone, or something else, is saying this makes sense.

And I'm looking for the good side. You need a believable positive side.

It has two parts. It should be positive and trustworthy.

On the plus side, being told you'll be making $1 million a year in five years isn't all that positive.

I can't believe you said you would make $1 billion a year.

So it should be both.

On the other hand, some lower the emotional level.

We must recover from them.

For example, everything I know is not true.

"We have no competition. No one makes widgets like this."

I probably know the person who created the widget, but the moment you say it to me, I discount half of what you say from then on.

Anything you don't understand or something you have to leap into your head will stop the flow of your presentation.

So you have to guide me like a 6th grade dub, dub, dub, but without patronizing me.

And it's a very difficult road.

But if you can do that, it works really well.

Anything that is inconsistent within your concept -- say X, Y or Z makes $10 million in sales, after 5 slides it will be $5 million...

One could be gross sales and one could be net sales, but I want to know that all the numbers together make sense.

And finally, errors and typos, silly mistakes and misplaced lines, it all shows how you can run a company if you can't present.

So all this is supplied together.

The best way to do this is to look to those of us who are better, those who have done this before.

Take a look at some of the most successful technology executives in business and see how their presentations go.

Here is Bill Gates' PowerPoint presentation.

Here's how Gates is working on it for Windows.

Is this the way to do a PowerPoint presentation? What do you think?

No, who do you think we should look to as role models?

Oh, isn't that funny! Here's another great one.

OK, Steve Jobs.

Here he is on a stage completely empty of little guys in black jeans or something.

What do you focus on?

So are these nice long bulleted lists of all things good?

No, it's not. Long bullet points are bad.

How are you? short. short bullet points.

But do you know? Better than short bullet points is no bullet points.

Please just give me a headline.

And what do you know?

Basically no.

What is your occupation?

i see the image Seeing is believing.

Just look at the image and you'll see it all.

Then you come back to me You're looking at me, why I'm such a great person, why I want to invest, why all this makes sense.

However, time is very short, so let's take a quick look at what should be included in your presentation.

First of all, none of the slides have big, long titles like "I'm going to present this to everyone on X days."

I know the day, I know who I am - I don't need them all.

Please tell us your company logo.

When you see a logo, it connects to your brain.

A short 15 or 30 second intro grabs my attention.

Please tell us a brief overview of your business.

This is not a 5 minute pitch. This is two sentences.

"We build widgets for the X, Y, Z markets."

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

That way you'll know the context.

It gives me the foundation for the whole thing you're going through. I can think of everything in relation to what you told me.

Then explain to me and show me who your management team is.

I would like to know the market size. Why is it worth entering this market?

I would like to know about your product, it is very important.

Now, this is not a product pitch or sales pitch.

I don't want to know every nook and cranny, but what the hell is that all about?

If it's a website, show us a screenshot of the website.

Please do not do live demos. Never do a live demo.

Create a canned demo or something that people will see why they buy it.

Now that you know what you're selling, tell me how you make money.

I would like to know what the business model is for each unit or the actual product you are selling.

I would like to know who you are selling to in terms of customers and if there are any special relationships that can help you, such as sales relationships or production partners.

Once again, verify.

But everyone has competition.

No company is without competition, even if competition is the old way of doing things.

I would like to know exactly what your competitors are. It helps you determine how your company fits into your overall business.

I want to know how special you are

I know what your competitors are doing. How are you going to stop them from eating your lunch?

And you can't pitch a VC without providing your financials.

I would like to know a year or two ago, or ever since you existed.

I would also like to know what will happen in the next 4-5 years.

5 is a bit too many. Probably four.

And I want to know how that business model translates into a company model on a product basis. In other words, how many widgets will you sell?

Earn X amount per widget. I would like to know what the driver is.

We'll have 1,000 customers this year, 10,000 next year, and we'll be able to do this and that with revenue.

It gives me a complete picture of what I'll be investing in over the next few years.

And I want to know how the money from me can help you get there.

I'm going to open an offshore factory in China, I'm going to spend everything on sales and marketing, I'm going to Tahiti, whatever.

But then comes the question, tell me how much you want.

I'm looking for 5 million, what is its valuation?

two millions? 100,000?

We hope you will invest in us. If I can't invest in myself, why should I?

So I would like to know if you have friends, family, angel investors, or more VCs.

Finally, with all that said, you told me all about it, and now I'm coming back to that conclusion.

This is a rising rocket.

Hope everything is positive.

And everything you say makes sense, everything makes sense.

And I think, "This is really great!"

Then just display the logo on the screen.

And I see the logo - OK, nice.

Well, I'm going back to you Nothing else to see, right?

Now we need to finish up. Dawn! --The last ball to fly me into space.

Now, how do you remember and execute the sequence in the process of doing this?

You realize I'm not looking at the screen, right?

The screen was in front of me, so I couldn't see it even if I wanted to.

So how do we know what's going on?

Now, I have a laptop in front of me.

what am i looking at

do you think i see that?

No, actually I'm looking at a special version of PowerPoint here. See previous and next slides and notes so you know what's going on.

PowerPoint has this built into every copy it ships.

If you use Apple's Keynote, there's an even better version.

There is also another program called Ovation that Adobe purchased last summer. This is useful for running timers and helps you keep track of what's going on.

So here's my summary for taking you to the moon.

I usually make a Top 10, but I don't have time, so I'm going to make 'David's Top 5 Presentation Tips'.

Fifth: Always use Presenter Mode, Ovation, or Presenter Tools.

It lets you know exactly where you're going, helps you pace yourself, and even provides a timer.

Tip 4: Always use the remote control.

Have you seen me on the computer? No, why not?

I'm using the remote control. Always use the remote control.

Third: The handouts you give are not presentations.

Follow my suggestions and you'll end up with a very lean, zen-like presentation. This is great for telling who you are and getting people emotionally involved, but it's not great for handouts.

Second, don't read the speech. Can you imagine?

(Reading) "You should invest in my company..." That doesn't work.

And the best presentation tip is to never look at the screen.

You have a connection with your audience, but you always want a one-on-one connection.

The screen should appear behind you and complement what you are doing, not replace you.

First, I would like to quote the great woman we all admire, Helen Keller.

And she was making a very profound statement. This remark was that science could find cures for many evils, but it could never discover man's greatest evil, and he was indifferent to evil.

So we know that indifference really comes at a high price, especially in a democracy.

And when you think about why people don't participate and why they don't become activists, people are often so exhausted by family responsibilities, especially women.

As you know, women have a lot of inhibitions.

Many of them have had so many traumas and many attacks in their lives.

That's why it's so hard for them to realize they have leadership abilities.

That they can get out there and change the world.

Another thing many women feel is that we think we have to do everything.

We are the only ones responsible for our family and it is very difficult to just delegate the duties that we are responsible for or have others help us.

We feel ashamed or guilty.

But we know we have to make this happen. Otherwise, we will forever have no time to volunteer to help the many causes we face today.

One area where women can spend some time is shopping.

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

(Laughter.) You know, I've never seen a hearse with a U-Haul on the back.

(Laughter) We have to live simply so that others can live simply.

And when you think about what kind of legacy you want to leave to your children and grandchildren, think about leaving them a legacy of justice.

This is a legacy they can not only imitate, but be proud of for the rest of their lives.

If we leave them with too many supplies, they will only fight and hate each other.

Remember that when you think about what we do.

Another thing we must do to liberate women, and ultimately to enable them to do the volunteer work they need to change the world, is to get young women a different kind of education.

Unfortunately, in our societies around the world, women are taught to be victims.

Women are not taught that they must protect themselves, support themselves, protect themselves.

Because when you actually look at the animal kingdom, you can tell which is the most ferocious, the male or the female.

You know it's a female, right?

So something happened to us, women at the top of the animal kingdom.

(Laughter.) So let me give you an example of how I found my voice.

And I was very lucky that when I was 25, I met a gentleman named Fred Ross Sr. He organized a chapter of a group called the Community Service Organization in my hometown of Stockton, California.

This is a grassroots organization and I was recruited as a volunteer.

So one day we were sitting in the office when a farm worker came in.

And he is paralyzed, can barely walk and has crutches.

And he needs help.

He needs someone to help him go to the welfare office and apply.

So I volunteered for it.

However, when I went to the welfare office, they refused to let me apply for this gentleman.

So I was at a loss, not knowing what to do.

So I went back to the office and said to Mr. Ross, "I can't let you apply."

And he said to me in a very stern tone, "I demand that you return to the welfare office immediately and see your supervisor.

And you ask him to let you apply. ”

And I thought, "Wow, can I do that?"

(Laughter.) So I thought about it, and I kind of overcame my anxiety and fear.

I went to the welfare office and requested to see the supervisor.

Sure enough, he came out, so I had to get Mr. Lewis to apply for welfare.

And he disabled himself and his family.

But it taught me a lesson.

It taught me that I have a voice.

Well, Mr. Ross also taught many of us, including Cesar Chavez and many other volunteers, many other things.

And he also taught me that you can't just make demands of people, especially civil servants.

And this is something we should always keep in mind. All civil servants, presumably, work for us.

Because we pay their salaries without using our taxes.

And they are actually our servants.

Some of them become leaders, but not all of them become leaders.

(Laughter) Sometimes the leader comes out of it.

Another thing Mr. Ross taught us is that voting is very important.

And it's not just about voting, it's about getting out there and getting other people to vote for you.

I will visit door to door.

A lot of voters have a lot of questions and they don't know how to vote, so they do phone banking and interact with voters.

And unfortunately, we know that in many countries people are not allowed to vote because of voter suppression in other countries as it is happening here in the United States.

But the point is, if we, as individuals, can go out and talk to people, we can remove their apathy and make sure they can vote.

So I want to use the example of women from our foundation, the Dolores Huerta Foundation, to show that sometimes people have power and they don't know it.

But once they find it, they do miraculous things.

So Leticia Prado is an immigrant from Mexico who only had a 6th grade education and speaks very limited English.

But she was very worried. Because the air quality in our southern part of Kern County, California, in the United States of America is so bad that middle school kids in their town called Weedpatch (here in Central Valley, California) couldn't go out and play in the schoolyard.

So she and her husband passed a bond to build a state-of-the-art gymnasium for middle school kids.

It was a huge success.

There she heard rumors that the principal was going to cancel the breakfast program for farmworker children because he thought it was too much paperwork.

So Leticia was elected as a member of the Board of Education.

And they kept the breakfast program and she fired the principal.

(Laughter) (Applause) So there was another rumor about corruption in the local water district.

So Leticia got elected to the Water District.

She then went through all the water district finances and found that $250,000 was missing from her bank account.

There, Leticia convened a grand jury, and several were arrested.

This is just one example of a woman who never went to high school or college but found her power.

Additionally, she persuaded others in the community to run for public office, and to her surprise, they all won.

So I think Leticia epitomizes what Coretta Scott King said.

And I would like to share this with you. "There will be no peace in the world until women are in power," said Coretta Scott King.

(Applause.) Now, I amended that statement to say that peace will never come to the world until feminists come to power.

(Laughter.) Because you know there's a difference, right?

Beyond that, if you want to define what a feminist is, it's someone who stands up for sexual and reproductive rights, immigration rights, the environment, LGBT rights, and unions and working people.

(Applause.) This means that men can be feminists too.

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

And one of the things we can do to stop wars and bring about peace is to ensure that the richest countries in the world also help the developing world.

Well, we have done this in the past.

After World War II, when Japan and Germany were in post-war devastation, the United States pumped a lot of tax dollars into rebuilding their economies and rebuilding their businesses.

And you can do it again.

And if you can think of how you can help these other countries.

For example, I would like to give an example of the problems we face in the United States.

We now know that there are many refugees living at the US border from Central America.

Why do people leave their homes, the beautiful homes that we visit as tourists?

Because they don't stand a chance.

And we think, "Hmm, bananas."

How many trillions of bananas does America consume every day?

and around the world.

Now, do people in Central America benefit from the bananas we consume?

No, it's not.

Profits will be donated to US companies.

And we think this is wrong.

Now, if people in Central America could get some of the money we pay for bananas, they wouldn't have to leave their homes.

They no longer need to come to the US border as asylum seekers.

Then perhaps many children would not have to be separated from their parents.

Now, we know that there are actually countries in the world that offer free education and free health care to all their citizens.

And that country is Cuba.

In Cuba, all citizens have access to medical care and all citizens receive free university education.

They are a nation of 11 million people.

Now, if a poor country like Cuba has this kind of resource and we know it's a poor country, we wonder why other rich countries like the US can't do the same.

I think we can make it happen.

(Applause.) But I know that won't happen until we, the people of the United States of America, and people around the world, start electing officials into government who truly care about their voters, who care about their people, and who promise that the resources they have will be used for the people and not for war.

So how do we achieve this?

We need to get rid of the indifference and get more people involved.

We know that if we can't have democracy in the United States, we can't have democracy around the world without people participating.

So it is imperative that we all go out and say: “Take the apathy off the sidewalk and join the march for peace and justice. Let's make Coretta Scott's vision a reality to bring peace to the world.”

Recently, there were midterm elections in the United States.

And what did we see?

We have seen more women, young people, people of color and LGBT people elected to public office.

And we know this happened - why?

Because so many women were participating in the march.

There was a women's march in America.

They held women's marches all over the world.

And now we know we have the potential.

We have the potential to remove indifference.

And if we can get everyone involved and everyone's dedication, I think we can make Coretta Scott's vision a reality.

So I would like to remind everyone around the world that one thing is that we have power, the poor have power, and all people have power.

But to achieve the peace we all crave, we all need to participate.

So what can I say?

can you do it?

We say, "Yes, we can!"

In Spanish we say "Sí, se puede".

thank you very much.

(applause)

A year ago, I told you about a book that was just about to be completed and published. Today I would like to talk about some of the controversies the book caused.

The book is called "The Blank Slate" and is based on the general idea that the human mind is a blank slate and that all its structure comes from socialization, culture, parenting and experience.

The “blank slate” was an influential idea in the 20th century.

Here are some quotes showing that. In the words of the historian José Ortega y Gasset, "Man has no nature." “Humans have no instincts,” said anthropologist Ashley Montague. The late scientist Stephen Jay Gould said, "The human brain can do anything, but it tends to do none."

There are many reasons to doubt that the human mind is a blank slate, some of which comes from common sense.

As many have told me over the years, anyone who has had multiple children knows that they come into the world with certain temperaments and talents. Not everything comes from outside.

Ah, anyone who has both children and house pets will have noticed that children exposed to words acquire human language, but house pets do not acquire human language, probably because there is some innate difference between them.

And anyone who has had a heterosexual relationship knows that the male mind and the female mind are not indistinguishable.

Also, I think there are increasing results from scientific research on humans that certainly humans weren't born with a clean slate.

One of them from anthropology is the study of human universality.

If you've studied anthropology, you know that it's a kind of professional pleasure for an anthropologist to show you how exotic other cultures can be, and that there are probably places out there where everything seems to be the opposite of how things are done here.

But if we instead look at what the world's cultures have in common, we find that there is a tremendous wealth of behaviors, emotions, and ways of interpreting the world found in all of the world's 6,000+ cultures.

Anthropologist Donald Brown has attempted to list them all, ranging from aesthetics, affections, and age situations, to weaning, weapons, weather, attempts at control, the color white, and worldviews.

Genetics and neuroscience are also increasingly revealing that the brain is a complex structure.

This is a recent study by neurobiologist Paul Thompson and his colleagues, who used MRI to measure the distribution of gray matter, the outer layer of the cortex, in a large sample of a pair of individuals.

They used a sham color scheme to encode correlates of gray matter thickness in different parts of the brain. In this scheme, differences are coded as purple, and non-purple colors show statistically significant correlations.

Well, this is what happens when you pair people at random.

By definition, two random individuals cannot be correlated in their cortical gray matter distribution.

This is what happens with fraternal twins who share half of their DNA.

As you can see, most of the brain is not purple. This indicates that if a person has a thick cortex in that area, so does their fraternal twin.

And here's what happens when you have two people who share all their DNA: clones or identical twins.

And we see vast areas of the cortex that are highly correlated with gray matter distribution.

These are not just differences in anatomy, such as the shape of the earlobe, but also affect thinking and behavior, as often depicted in this famous cartoon by Charles Adams. "The Mariphate twins, separated at birth, meet by chance."

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

Well, this cartoon isn't all that exaggerated. Because studies of identical twins separated at birth and tested as adults have shown that they share striking similarities.

And this occurs in all pairs of birth-separated monozygotic twins studied so far, but even less so in birth-separated dizygotic twins.

My favorite example is a pair of twins. One was raised in a Nazi family in Germany as a Catholic and the other in a Jewish family in Trinidad.

When they walked into the Minnesota lab, they wore the same navy blue shirts with epaulettes. We both liked buttered toast dipped in coffee, we both wore rubber bands around our wrists, we both liked to flush toilets before and after we used them, we both liked to sneeze in crowded elevators and surprise people by watching them jump.

Now, while this story may seem true, a battery of psychological tests yields the same results. So, identical twins who were separated at birth show some pretty amazing similarities.

Now, given that both common sense and scientific data call blank theory into question, why was it such an attractive concept?

Well, there are a lot of political reasons why people felt comfortable with that.

Most importantly, if we are a blank slate, zero is equal to zero, so by definition we are equal.

But if something is written in stone, some people may have more than others, which, according to this line of thinking, justifies discrimination and inequality.

Another political fear of human nature is that if we are a blank slate, we can make humanity perfect. This is the long-held dream of perfecting humanity through social engineering.

On the other hand, if we are born with certain instincts, perhaps some of those instincts drive us towards selfishness, prejudice, and violence.

Now, in the book I argue that these aren't really collateral.

Simply put, first of all, the concept of fairness is not the same as the concept of equality.

So when Thomas Jefferson wrote in the Declaration of Independence, "We hold these truths self-evident, that all men are created equal," he did not mean, "We hold these truths self-evident, that all men are clones."

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

Also, even if we are born with certain mean motives, it doesn't automatically lead to mean behavior.

That's because the human mind is a complex system of many parts, some of which can constrain others.

For example, there is good reason to believe that virtually all humans are born with a moral sense and possess cognitive abilities that can benefit from the lessons of history.

So even if people have compulsions for selfishness and greed, it's not the only thing in the skull, there are other parts of the mind that can counteract them.

In this book I cover these controversies, as well as many other hot buttons, hot zones, Chernobyl, Third Rail, etc., such as art, cloning, crime, free will, education, evolution, sexism, God, homosexuality, infanticide, inequality, Marxism, morality, Nazism, parenting, politics, race, rape, religion, resource depletion, social engineering, technological risk, war, and more.

And, of course, there was a certain amount of risk involved in tackling these subjects.

When I wrote the first draft of this book, I circulated it to many of my colleagues for comments. Some of the responses we got there are shown below. "It would be better to install a surveillance camera in the house."

"Don't expect any more awards, job offers, or academic positions."

"Please tell the publisher not to include your birthplace in your author bio."

"Do you have a tenure?"

(Laughter.) Well, the book came out in October, and nothing terrible has happened.

I like it. There are certainly reasons to be nervous, and knowing the history of what has happened to people who have taken controversial positions or discovered disturbing findings in behavioral science, there have been moments of tension.

There are numerous examples of people being called Nazis, physically assaulted, or threatened with criminal prosecution for encountering or discussing controversial discoveries, some of which I tell in the book.

And you never know when you might encounter one of these booby traps.

My favorite example is two psychologists who have studied left-handed people and have published data showing that left-handed people are, on average, more likely to get sick, have accidents, and live shorter lives.

By the way, it's not clear since then whether that was an accurate generalization, but the data at the time seemed to support it.

Well, soon they were under a barrage of incensed letters from enraged left-handers and their defenders, death threats, and bans on the subject in many scientific journals, and they literally feared opening their mail because of the poison and swear words they unintentionally inspired.

Well, it's still early in the night, but this book has been out for half a year and nothing terrible has happened.

Nothing professionally disastrous has happened - I have not been exiled from the city of Cambridge.

But I wanted to talk about two of those hot buttons that generated the most reaction in the 80+ reviews The Blank Slate has received.

Let's expose this list for a few seconds and see if you can guess which two it is. We estimate that perhaps two of these topics influenced perhaps 90% of the responses in various reviews and radio interviews.

It is not violence or war, it is not race, it is not gender, it is not Marxism or Nazism.

art and parenting.

(Laughter.) So let me tell you what caused such an angry reaction. And I'll let you decide if the claim is really that outrageous.

Let's start with art.

Note that art is among the long list of human universals presented in a few slides.

There is no society in the corner of the world where there is not what we call art.

The visual arts, the decoration of surfaces and bodies, appear to be universal to humans.

Storytelling, music, dance, and poetry are found in all cultures, and many of the motifs and themes that give us artistic enjoyment are found in all human societies. There are even peculiarities like the preference for symmetrical forms, the use of repetition and variation, and the fact that poetry all over the world has lines that are nearly three seconds long, separated by pauses.

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

And I've collected maybe 10 or 15 high-end magazine headlines lamenting the fact that art is in decline in our time.

Here are some representative words. “We can say with some confidence that our time is one of decline, that the level of culture is lower than it was fifty years ago, and that evidence of this decline can be found in every sector of human activity.”

These are the words of T.S. Eliot over 50 years ago.

And more recently, "The possibility of sustaining high culture in modern times is becoming more and more problematic.

Serious bookstores are losing franchises, non-profit theaters are surviving largely through the commodification of their repertoire, symphony orchestras are downsizing their programming, public television is becoming more reliant on reruns of British sitcoms, classical radio stations are declining, museums are relying on blockbusters, and dance is in decline. ”

That's what famed drama critic and director Robert Bulstein said about five years ago on The New Republic.

Well, the truth is, art isn't on the decline.

I don't think it comes as a surprise to anyone here, but by any standard, it's never been more prosperous.

Of course, there are entirely new art forms and new media, many of which we have heard about in the last few days.

By any economic standard, demand for art in all its forms is skyrocketing, as evidenced by opera ticket prices, book sales, book publications, music titles released, and new albums.

The only truth to this complaint that art is in decline comes from three areas.

One of them is the field of elite art since the 1930s. For example, works of the kind performed by major symphony orchestras whose repertoire mostly predates 1930, and works exhibited in major galleries and prestigious museums.

Perhaps 40 or 50 years ago, the literary critic was a sort of cultural hero in literary criticism and analysis. It's become something of a national joke now.

And college humanities and arts programs are certainly in decline in many respects.

Students are leaving school in droves and universities are cutting back on investment in the arts and humanities.

Now for the diagnosis.

They didn't ask me for it, but by their own admission, they need all the help they can get.

And I would like to suggest that it is no coincidence that this presumed decline of elite art and criticism occurred at the same point in history when there was a widespread denial of humanity.

You will find famous quotes. If you search the web, you can find it among literally dozens of basic English syllabuses. "About December 1910, human nature changed."

It's a paraphrase of Virginia Woolf's words, but there's some debate as to what she really meant.

But looking at these syllabi it is very clear. The term is now used in the 20th century as a way of saying that all forms of art appreciation that have existed for centuries or even millennia have been abandoned.

The beauty and joy of art—perhaps universal to man—began to be considered sugary, kitschy, or commercial.

Barnett Newman famously said, "The impulse of modern art is the desire to destroy beauty," which was considered bourgeois or lame.

This is just an example.

As such, it is perhaps a prime example of the visual depiction of the female figure in the 15th century. This is a prime example of how women were portrayed in the 20th century.

And, as you can see, something has changed in the way elite art appeals to the senses.

Indeed, among the modernist and postmodernist movements were visual arts without beauty, literature without narrative and plot, poetry without meter and rhyme, architecture and planning without decoration, human scale, green spaces and natural light, music without melody and rhythm, and criticism without clarity, attention to aesthetics, and insight into the human condition.

(Laughter) Let me give you an example to back up my last statement.

But here, here, one of the most famous literary English scholars of our time is Berkeley Professor Judith Butler.

And here is an example of her analysis. “The shift from a structuralist account, understood as capital structuring social relations in a relatively homogenous way, to a hegemonic view in which power relations are objects of repetition, convergence, and redefinition, introduced the question of temporality into the thinking of structure, and marked a shift away from the form of Althusser theory, in which structural totality is the theoretical object...”

Well, you can see that.

By the way, this is one sentence. can actually be parsed.

Now, the argument in the "blank slate" was that, if not art in general, 20th century elite art and criticism have neglected beauty, pleasure, clarity, insight, and style.

People are moving away from elite art and criticism.

What a mystery - why?

Well, this turned out to be perhaps the most controversial claim in the book.

Someone asked me if I stopped doing it to divert anger from discussions of gender, Nazism, race, etc. I will not comment on that.

But it certainly provoked an energetic response from many university professors.

Well, another hot button is parenting.

And the starting point, to that discussion, was the fact that we've all been on the advice of the parenting industry complex.

Well, here are some typical quotes from distressed mothers. “I am overwhelmed with parenting advice.

I am supposed to do a lot of physical activity with my children, to help them develop the habit of building strength and grow up to be healthy adults.

And so that they grow up smart, I'm supposed to do all sorts of intellectual play.

And there are all sorts of games - clay for manual dexterity, word games for successful reading, big motor games, small motor games. I feel like I can dedicate my life to figuring out what to play with my kids. ”

I think anyone who became a parent recently can relate to this mother.

Now, here are some somber facts about parenting.

Most of the parenting research on which this advice is based is useless. It doesn't help because you can't control heritability. They measure some correlation between parental behavior and how children develop, postulating causality that parenting shaped children.

Children of parents who talk to their children often grow up to be articulate, and children of parents who hit their children grow up to be violent.

And few people control the likelihood that a parent will inherit the gene, which makes their child more likely to speak out or become violent.

There is no way of knowing whether these conclusions hold until the study is repeated with adoptive children who provide the environment but not the genes.

Genetically controlled studies have yielded some sobering results.

Remember the Marifert twins. Separated at birth and then met at the patent office, they are surprisingly similar.

Now, what if the Marifert twins had grown up together?

You might think that would make them even more alike, since they not only share genes, but they also share an environment.

That makes them very similar, doesn't it?

error. Identical twins or siblings are just as alike when they are born apart as they are when they grow up together.

Over the years, all the events that happened in that house don't seem to leave a lasting imprint on your character or your intellect.

A complementary finding, drawn from a completely different methodology, is that adoptive siblings raised together are mirror images of separately raised identical twins, who share parents, homes and neighborhoods and do not share genes.

OK -- Two different studies yielded similar results.

It suggests that children in the long run are shaped not in the long term by their parents, but in part--only in part--by their genes, partly by their culture, the culture of the entire nation and the children's own culture, by their own group of peers--that's what children care about, as I heard today from Gilles Sobure--and, to a very large extent, more chance than most people are ready to admit. A chance event in the wiring of the brain in the womb. Random events that happen in life.

Finally, let me say just one word to return to the topic of choice.

I believe that the sciences of human nature—behavioral genetics, evolutionary psychology, neuroscience, and cognitive science—will increasingly disrupt different dogmas, careers, and entrenched political belief systems in the coming years.

And it gives us options.

The choice is whether certain facts and topics about humans are considered taboo, forbidden knowledge, or whether one should not go there because there is nothing to be gained from it, or whether one should honestly explore them.

My answer to this question comes from the great 19th century artist, Anton Chekhov. As the saying goes, “A man becomes better when he shows himself as he is.”

And I don't think this argument could be made more eloquent.

thank you very much.

(applause)

This is Hogeweig.

It is a small town district very close to Amsterdam in the Netherlands.

There are 27 houses where 6 or 7 people live.

There is a small mall with restaurants, pubs, supermarkets and club rooms.

There are streets, there are alleys, there are theaters.

It's actually an old people's home.

A nursing home for people with advanced dementia who need 24/7 care and support.

Dementia is a terrifying disease, yet there is no cure.

It's becoming a big problem all over the world, for people, for politicians, and for the world.

You can see that the nursing home has a waiting list.

Most people who come to dementia nursing homes are women.

This is because women are accustomed to caring for their husbands and can manage to care for their husbands with dementia, but the opposite is not so easy for gentlemen.

Dementia is a disease that affects the brain.

It confuses your brain.

People no longer know what is going on, what is going on, and who the people are.

they are so confused.

And because of that confusion, they become anxious, depressed, and aggressive.

This is a traditional old people's home.

I worked there in 1992.

I was a care manager.

And we often discussed the fact that what we were doing there wasn't what our parents, our friends, or ourselves wanted.

And then one day we said, "You can keep saying this and nothing will change.

We are in charge here.

We need to do something about this in order to want our parents here. ”

we talked about that. And what we saw every day was that people living in our nursing homes were confused by their environment. Because what they saw was a hospital-like environment with uniformed doctors, nurses and paramedics, living in wards.

And they didn't understand why they lived there.

They looked for a place to escape.

They sought and hoped to find the door to return home.

And we said what we do in this situation is to provide more confusion to people who already have confused brains.

We were adding confusion to confusion.

And it wasn't what they needed.

These people wanted life, and our help, to deal with their dementia.

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

They wanted to have a normal home where they could smell dinner on the stove in the kitchen.

Alternatively, you are free to go to the kitchen and grab something to eat or drink.

That was what these people needed.

And that is what we should organize for them.

And we said we should organize this just like at home. That way, you don't live in groups of 15, 20, 30 like you would in a hospital ward.

No, it's a small group like a family of 6 or 7 people.

Like living with friends.

And you should find a way to choose people based on their ideas about life so that you have a good chance of becoming friends when you live together.

Then, we interviewed all residents' families about things like "What is important to you as a father?", "What is important to you as a mother?", "What is your life like?"

And we found 7 groups. We call them lifestyle groups.

For example, we discovered this formal lifestyle.

This lifestyle causes people to interact with each other in a more formal, distant way.

Their daily rhythm starts late in the day and ends late in the day.

Classical music is heard more often in this lifestyle group than in other lifestyle groups.

And their menu is more French than traditional Dutch.

(Laughs) It's the exact opposite of a craftsman's way of life.

It is a very traditional lifestyle, they wake up early in the morning and go to bed early. Because all their lives they have worked hard, mostly by hand, running very small family businesses, small farms and shops. Or like Mr. B, he was a farmer.

And he said he would go to work every morning with a paper bag containing lunch and a cigar.

That one cigar was the only luxury he could afford.

And after lunch he drank one of the cigars.

And, until the day he died in Hogeweig, he was in this little hut every day after lunch to smoke a cigar.

is my mother

She lives a cultured lifestyle and has been living in Hogewijk for six weeks now.

And that lifestyle is about traveling, meeting other people, other cultures, and an interest in art and music.

There are more lifestyles.

But that's what we talked about and that's what we did.

But it's not life in a home with a group of like-minded people, it's not your life, it's not your family's life.

There is more to life than that. Everyone wants to enjoy life and have a meaningful life.

we are social animals. We need social life.

That's what we started with.

We want to get out of the house to shop and meet other people.

Or go to the pub and have a beer with your friends.

Or, like Mr. W, who likes to go out every day and see if there are nice women around.

(Laughter) And he's very polite to them, he wants a smile and he makes it happen.

And he dances with them in the pub.

Every day is a festival.

Some people would rather celebrate life by going to restaurants, drinking wine with friends, or having lunch or dinner.

And my mother walks in the park, sits on a bench basking in the sun, hoping that passers-by will come and sit next to her and talk about life and the ducks in the pond.

Social life is important.

It means that you are part of society, you belong to society.

And that is what we humans need.

Even if you have advanced dementia.

This is the view from my office window.

And one day I saw a woman coming from one side and another woman coming from the other side and they met at the corner.

And I knew two women very well.

I often saw them walking around outside.

And sometimes I tried to have a conversation with them, but their conversation was...

rather difficult to understand.

But I saw them meeting, I saw them talking, I saw them gesturing.

and they had fun together.

They said goodbye and went their separate ways.

And that's what you want in life, meeting other people and being part of society.

And that's what I saw.

Hogewijk is a place where people with very advanced dementia can live freely and safely because the professionals and volunteers who work there know how to deal with dementia.

And professionals know how to do their professional work in a way that fits naturally into the lives of the residents.

And that means management has to provide those people with everything they need to do their jobs.

We need managers who dare to do this.

Do something different than what you've done in a traditional nursing home.

You can see that it works.

I think this can be done anywhere as this is not for the rich.

We've done this on the same budget as the traditional old age homes in this country.

We work only on the national budget.

(Applause.) Because it has to do with thinking differently and looking at the person in front of you and asking what they need right now.

It's about smiling, thinking differently, how you act, and it doesn't cost anything.

Another thing is to choose.

It's about choosing what to spend your money on.

I always say, "Red curtains are as expensive as gray ones."

(Laughter) It can be done anywhere.

thank you.

(applause)

What I want to talk to you about today is how I see robots invading our lives on different levels and on different timescales.

And looking to the future, it's hard to imagine a world 500 years from now without robots everywhere.

Despite the dire predictions made by many about our future, assuming we're still alive, we can't imagine a world without robots.

And the question is, if they will be here in 500 years, will they be anywhere else sooner?

Will it still exist in 50 years?

Well, I think it's quite possible. There will be many robots everywhere.

And actually, I think it will be much sooner than that.

We believe we are on the verge of robots becoming commonplace. I think the first few robots started appearing around 1978 or 1980 in the personal computer era.

Computers appeared through games and toys.

And as you know, the first computer most people had at home might have been a computer with a tiny microprocessor built in to play Pong, and other games that came after.

And we're starting to see the same thing with robots. LEGO MINDSTORMS Furby -- Anyone here -- Anyone have a Furby?

Yes, 38 million units sold worldwide.

they are pretty common. And they are small robots, simple robots with a few sensors and a little bit of processing actuation.

On the right is another robot doll that was available several years ago.

And just like in the early days of computer-based amateur-to-amateur communication, there are now a wide variety of hacking kits and how-to books available.

On the left is the Evolution Robotics platform, where you put your PC and program it with a GUI to walk around the house and do different things.

And then there's Sony's Aibo, a more expensive robotic toy. And to the right of that is PaPeRo, developed by NEC. I don't think this will ever be released.

But still, there are such things in the world.

Over the last couple of years, we've seen Lawnmower Robots, Husqvarna at the bottom and Friendly Robotics, an Israeli company at the top.

And in the last 12 months or so, we've seen a flood of household cleaning robots.

Top left is a very good home cleaning robot sold by a British company called Dyson. They never released it, except that it was very expensive at $3,500.

However, the bottom left shows an Electrolux on sale.

The other is from Karcher.

The bottom right is what I made in my lab about 10 years ago, and I finally commercialized it.

Let me show you.

Chris said I think I will give this as a gift after the talk.

This is a floor-cleaning robot that you can go out and buy.

And it starts with a kind of repeating cycle.

If it hits something, can you see it?

Now I clean up my surroundings by chasing walls and chasing my feet. Let's see -- oh, who stole my Rice Krispies? They stole my Rice Krispies!

(laughter) Don't worry, relax, no, relax, it's a robot, it's smart!

(Laughter) Look, three-year-olds don't worry about that.

Adults are really annoying.

(Laughter) Here's some silly stuff.

(Laughter) Okay.

(Laughter) I don't know, but I put a bunch of Rice Krispies in there and put some change in it. So let's shoot. Let's see if it cleans up.

OK. So -- we'll leave that for later.

(Applause.) Actually, part of the trick was building a better cleaning mechanism. Information on board was very simple.

And that's true for many robots as well.

I think we've all become kind of computational chauvinists and think it's all about computation, but mechanics still matter.

Here is another robot we have been developing over the years, PackBot.

This is a surveillance robot for the military, to monitor caves and the like ahead of the troops.

But we needed it to be pretty robust, much more robust than the robots we make in the lab.

(Laughter) The robot has a PC running Linux.

It can withstand 400G impact. This robot has local intelligence and can flip itself over, stay within range, and climb upstairs on its own.

Well, I'm doing local navigation there.

When the soldier ordered him to go upstairs, he went upstairs.

It was not a controlled descent.

(laughs) Let's go.

And the big breakthrough for these robots was actually September 11th.

Later that night, we dropped the robot off at the World Trade Center.

Nothing could be done with the main pile of rubble and the situation was so bad there was nothing left to do.

However, we entered all the surrounding buildings that had been evacuated, looking for possible survivors in buildings that were too dangerous to enter.

Let's run this video.

REPORTER: ...comrades on the battlefield help reduce combat risk.

Nick Robertson has such a story.

Rodney Brooks: Can I have another one of these?

Ok, good.

So this is the corporal who saw the robot two weeks ago.

He's sending robots into the cave to find out what's going on.

Robots are fully autonomous.

The worst thing that happened in the cave so far was when one of the robots fell 10 meters down.

I mean, a year ago the US military didn't have these robots.

Now they are working in Afghanistan every day.

And that's one of the reasons a robot invasion is said to be happening.

There is a big shift happening in the way technology works.

thank you.

And over the next few months, we'll be sending production robots down the wells to extract years' worth of oil out of the ground.

Extremely Harsh Environment, 150°C, 10,000 PSI.

Autonomous robots have come down and are doing work like this.

But such robots are a little harder to program.

In the future, how will robots be programmed to make them easier to use?

I'd really like to use a robot here, please stand up for a robot named Chris. yes. have understood.

come here. Note that he thinks the robot should be a little stiffer.

That's what he does. But I will -- Chris Anderson: I'm just British. RB: Oh.

(Laughter) (Applause) I'm going to teach this robot a task. It's a very complicated task.

Notice here, he nodded there, showing me that he understood the flow of communication.

If I said anything out of the ordinary, he would look at me suspiciously and curtail the conversation.

So now I brought this up in front of him.

I looked into his eyes and saw that his eyes were looking at the top of this bottle.

And I'm here doing this job and he's doing an inspection.

His eyes roll back and forth at me to see what I'm looking at. So we share attention.

So when I do this job, he sees what happens next and looks at me. And now let's give him a bottle and see if he can do the job. can it?

(Laughter) Okay. he is very good yes. good, good, good

I didn't teach you how.

See if you can undo it again.

(Laughter) And he thinks robots have to be really slow.

Good robot, that's good.

So we saw a lot there.

I saw when we were interacting, trying to show someone how to do something, and giving visual attention.

The other, whether we understand it or not, communicates their internal state to us and coordinates social interactions.

There was a common attention to focusing on similar things and finally recognizing socially communicated reinforcement.

And we think that's how we want to interact with robots in the future, so we're trying to build it into our research robots.

I just want to show you one technical diagram here.

The most important thing for building a socially interactive robot is its visual attention system.

Because it's paying attention because it understands what it's looking at, what it's interacting with, and what you're doing.

In the video I'm going to show you, you'll see the visual attention system on the robot. The system searches for skin tones in HSV space, so it works with all human colors.

Look for saturated colors in toys.

Then look for moving objects.

Then we weight them together into an attention window, looking for the places with the highest scores, where the most interesting things are happening. And then my eyes move there.

And that's exactly what it is.

At the same time, it can also be considered top-down. They may decide they are lonely and look for skin color, or they may decide they are bored and look for toys to play with.

And these weights change.

And here on the right side is what's called the Steven Spielberg Memorial Module.

Have you seen the movie "AI"? (Audience: Yes.) RB: Yeah, it was really bad, but remember especially when the little robot Haley Joel Osment was watching the blue fairy for 2000 years?

Well, that solves that problem. This is Gaussian Habituation, which becomes more and more negative when you focus on one thing.

And because I get bored, I turn away from other things.

So once you have it, here's a robot, Kismet, scrounging around for toys. I can see what it's looking at.

The direction of the line of sight can be deduced from the eyeball covering the camera, and it can be seen that the toy is actually looking at it.

And there is a bit of an emotional response here.

(Laughter) But if a more important person comes into view, I'll still pay attention – like Cynthia Brizeal, the creator of this robot, coming from the right.

It looks at her and pays attention to her.

Kismet has an underlying three-dimensional emotional space, or vector space, where it resides emotionally.

And in different parts of that space it is expressed - can I add volume here?

Can you hear it outside now? (Audience: Yes.) Kismet: Do you really think so? do you really think so?

do you really think so?

RB: So you're expressing emotions through facial and vocal prosody.

And when I was working with robots here, Chris the robot was measuring the prosody of my voice. As such, the robot was able to measure the prosody of four basic messages that mothers give their children before they are verbalized.

Here we have a naive subject admiring the robot: Voice: Nice robot.

You are a very cute little robot.

(laughter) RB: And the robot is responding appropriately.

Voice: ...very good, Kismet.

(laughter) VOICE: Look at my smile.

RB: That's funny. She imitated that smile. This happens often.

These are naive subjects.

Here we asked them to get the robot's attention and indicate when to get the robot's attention.

Voice: Hey, Kismet, oh there.

RB: So she found herself getting the robot's attention.

Voice: Kismet, do you like toys?

RB: Well, we're being asked to ban robots here, but this first woman is mentally squeezing robots.

Voice: No, no, don't do that. no.

(Laughter) Not right. no no

(laughs) RB: Let's put that aside.

Summed it up. Then put them in order.

When we talk to someone, we talk.

Then we raise our eyebrows or move our eyes to give the other person the idea that it's our turn to speak.

And they talk, and we pass the baton back and forth between each other.

So I decided to incorporate this into the robot.

We had a bunch of naive subjects, but we didn't tell them anything about the robot.

Now what they didn't know was that the robot didn't understand a word they said and the robot didn't speak English.

It's just saying random English phonemes.

And I want you to look carefully at the beginning of this, this guy, this guy named Richie, just happened to be talking to a robot for 25 minutes -- (laughter) -- "I have something to show you.

I'd like to show you my watch. ”

Then, bring the center of the clock into the robot's field of view, point it at it, and give a motion cue, and the robot can see the clock successfully.

I don't know if he understands the robot -- notice the shift.

Richie: Okay, I have something to show you. Ok, this is the watch my girlfriend gave me.

Robot: Oh, that's great.

Richie: Oh, look, there's a little blue light in there too. I almost lost this week.

(laughter) RB: So it's making eye contact with him and chasing his eyes.

Richie: Can you do the same? Robot: Oh, sure.

RB: And they do that kind of communication well.

And here's another side of what Chris and I were doing.

This is another robot, Cog.

First they make eye contact, then when Christy looks at the toy, the robot estimates the direction of her gaze and sees what she sees.

(Laughter) So in the next few years, we're going to see a lot more of these kinds of robots in the lab.

But there are two big questions people ask me. If we make these robots more and more human, will we embrace them? Will we eventually need rights?

And another question people ask me is would they want to take over?

(Laughter.) And the first theme, you know, this is a very Hollywood theme in a lot of movies. You probably recognize these characters here - in each of these cases, the robot wants more respect.

So should robots be respected?

After all, they are just machines.

But I think we have to accept that we are just machines.

After all, that's certainly what modern molecular biology tells us.

There is no explanation for how molecule A appears and docks with this other molecule.

And it is, as you know, propelled forward by various electrical charges, and then the soul intervenes and tweaks those molecules so that they are connected.

It's all mechanical. we are the mechanism.

If we are machines, then at least in principle we should be able to build machines out of other things that are as alive as we are.

But in order to accept that, I think you have to give up your specialness in a way.

And, over the past few hundred years at least, we have repeatedly been set back from specialness by the barrage of technology.

500 years ago, when the earth began to orbit the sun, we had to abandon the idea that we were the center of the universe. 150 years ago, thanks to Darwin, we had to abandon the idea that we were different from animals.

And imagining is always difficult for us.

Lately we've been overwhelmed by the idea that maybe we didn't even have our own creative events on this planet, but people don't really like it. And he said the human genome probably only has 35,000 of our genes. And it really was -- people didn't like it, we have more genes than that.

We don't want to give up our specialness, so I think it's unacceptable for us to have the idea that robots might really have feelings, or that they might be living beings.

But in the next 50 years or so, we will come to accept it.

The second question is whether the machine will try to take over.

And the canonical scenario here is that we create these things, grow them, nurture them, they learn a lot from us, and then they start to decide we're pretty boring and slow.

They want to take over from us.

And anyone with a teenager would know what it's like.

(Laughter) But Hollywood is extending that to robots.

And the question is, will someone accidentally build a robot to take our place?

It's like the lonely man in the backyard, you know, who "accidentally built a 747."

I don't think that will happen.

And I don't think so -- (laughter) -- I don't think we're going to intentionally create an obnoxious robot.

We do, you know, they're not going to make super bad robots.

You need a slightly bad robot before that, and a not-so-bad robot before that.

(Laughter) And we're not going to leave it at that.

(Laughter) So I think I'll just leave it at that. Robots are coming, we don't have to worry too much, it's going to be a lot of fun and I hope you all enjoy the journey over the next 50 years.

(applause)

On August 28, 1963, Martin Luther King, Jr. delivered the "I have a dream" speech at the March on Washington for Jobs and Freedom.

On that day, nearly 250,000 people gathered at the National Shopping Mall to demand an end to the discrimination, segregation, violence and economic exclusion that black people still face across America.

None of this would have been possible without the march's chief organizer, a man named Bayard Rustin.

Rustin grew up in a Quaker family and began peacefully protesting racism in high school.

He remained a pacifist throughout his life and was imprisoned in 1944 as a World War II conscientious objector.

During his two years in prison, he protested internally against the segregated facility.

Wherever Rustin went he organized, advocated and was always attuned to methods, groups and people furthering the message of equality.

He joined the Communist Party when civil rights for black Americans was one of the party's priorities, but soon became disillusioned with the party's authoritarian tendencies and left.

In 1948 he traveled to India to study the peaceful resistance strategy of the recently assassinated Mahatma Gandhi.

He returned to the United States with a strategy for peaceful protest that included civil disobedience.

He began working with Martin Luther King Jr. in 1955 and shared these ideas with him.

As King's fame grew, Rustin became a key adviser to King and a major strategist in the wider civil rights movement.

He brought his organizing expertise to the 1956 bus boycott in Montgomery, Alabama. In fact, he had organized and participated in the transportation protests that triggered the boycott almost ten years earlier.

His largest organizing project came in 1963, when he directed the planning of the National March on Washington.

The potential for riots, which could injure marchers and undermine the peaceful protest message, was a major concern.

Rustin not only worked with Washington DC police and hospitals to prepare, but also organized and trained a volunteer force of 2,000 security officers.

Despite his deft management, some other organizers did not want Rustin to lead the march with other Southern leaders because he was gay.

Despite this disdain, Rustin remained focused and delivered the demands of the marchers in an address to President John F. Kennedy on the day of the march.

The march itself went smoothly without any violence.

The act is credited with passing the Civil Rights Act of 1964, which abolished segregation in public places and prohibited employment discrimination, and the Voting Rights Act of 1965, which outlawed discriminatory voting practices.

Despite decades of service, Rustin's positions on certain political issues were unpopular among his colleagues.

Some thought he was not critical enough of the Vietnam War, or too eager to cooperate with the political establishment, including the president and Congress.

Some were uncomfortable with his former communist affiliation.

Ultimately, however, both his belief in working with government and his membership in the Communist Party were driven by his desire to achieve the greatest and fastest possible tangible gains in freedom for black Americans.

Rustin held several influential positions in the 1960s and 70s, but never stopped working.

He came out as gay in the 1980s and helped bring attention to 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, praising him for "a march toward true equality, no matter who we are or who we love."

I came here about four years ago to talk about the relationship between design and happiness.

At the very end of it, I gave a list under that title.

I've learned very little extra since then (laughs) -- but since then I've turned them all into projects.

These are inflatable monkeys found in every city in Scotland. "Everybody always thinks they're right."

They were integrated in the media.

“Drugs are fun in the beginning, but then they become a pain.”

We are changing media.

This is a projection that allows us to see the observer as he walks.

You really can't help tearing out the spider's web.

These are all part of graphic design.

We do them for our clients.

they are entrusted.

I will never have the money to actually do the installments or pay for all the billboards and production costs. As such, advertising always follows the client.

65,000 coat hangers on a street lined with fashion stores.

"Worrying doesn't solve anything."

"Money Doesn't Make Me Happy" was first published in a magazine spread.

The printer lost the file but didn't tell us.

This magazine, in fact, had the next 12 pages when I subscribed.

It said, "Money certainly makes me happy."

And my friend in Austria felt very sorry for me and persuaded the owner of the biggest casino in Linz to let me wrap the building.

This is the large pedestrian zone in Linz.

It just says "money" and if you look at the side street it says "doesn't make you happy".

I had a show in New York last week.

We steamed the window permanently and had a different designer come in every hour and write what they learned on the window steam.

Milton Glaser, Massimo Vignelli and others all attended.

Singapore has been very controversial.

This is a small spot we photographed there, which will be exhibited at the large Jumbotron in Singapore.

And, of course, it is dear to my heart. Because all these feelings, some mundane, some a little deeper, all originally came out of my diary.

And I often look at my diary to see if I want to change anything about the situation.

If it's seen enough time, I'll really do something about it.

And finally, there is the billboard.

This is our rooftop in New York, our studio rooftop.

This is a stencil on newsprint and newsprint.

Leave it in the sun.

As you know, newspapers yellow significantly when exposed to sunlight.

A week later we removed the stencils and leaves and shipped the newsprint to a sunny location in Lisbon. So the sign on the first day read, "It's foolish to complain. Either do it or forget it."

After 3 days it was gone and after a week it was no longer complaining.

(laughs) Thank you very much.

(applause)

Start with the dreaded question. Are we headed for a jobless future?

Interest in this question has exploded due to remarkable advances in technology such as self-driving cars, but since it has been asked so many times, the real question may be whether this time is really different.

Concerns that automation could displace workers and create mass unemployment go back at least 200 years to the Luddite Rebellion in England.

And since then, this concern has surfaced again and again.

I suspect most of you have never heard of the Three Revolutions Report, but it was a very remarkable report.

The report, put together by a group of talented people, including two Nobel laureates in fact, was submitted to the President of the United States and argued that the United States was on the brink of economic and social cataclysm as industrial automation would put millions out of work.

Well, that report was delivered to President Lyndon Johnson in March 1964.

More than 50 years later, of course, that hasn't really happened.

And it's a story that's been told over and over again.

This alarm has been issued repeatedly, but it has always been a false alarm.

And it was a false alarm, which led me to a very conventional way of thinking about this.

And it essentially shows that technology can destroy entire industries.

It may wipe out entire professions and types of jobs.

But at the same time, of course, progress will lead to something completely new.

Therefore, new industries will be born in the future, but naturally people will have to be hired in those industries.

There will be new kinds of works, some of which we cannot even imagine today.

That was the story so far, the positive story.

It turns out that the newly created jobs are generally much better than the old ones.

For example, they are becoming more attractive.

They find themselves in safer and more comfortable working conditions and, not surprisingly, are paid more.

So, it turned out to be a positive story.

That's what has happened so far.

But one particular working class is a completely different story.

For these workers, technology is completely destroying jobs and not creating any new opportunities.

And these workers are of course horses.

(Laughter) So you can ask a very provocative question. Is it possible that at some point in the future a significant portion of human labor will be as redundant as horses?

Well, you may have a very intuitive and reflexive reaction to it.

"That's absurd," you might say.

How can humans be compared to horses? ”

Horses, of course, were very limited, and when cars, trucks, and tractors came along, horses really had nowhere else to turn.

People, on the other hand, are intelligent. We can learn and we can adapt.

And in theory it should mean that we can always find something new and always remain relevant to the future economy.

But here's the really important thing to understand.

The machines that will threaten workers in the future are not like cars, trucks and tractors that have been replaced by horses.

The future will be filled with machines thinking, learning and adapting.

What that really means is that technology is finally starting to erode basic human capabilities. It is this ability that makes us so different from horses and has so far allowed us to stay ahead of the march of progress and stay relevant, and is in fact essential to the economy.

So what really makes today's information technology so different from what we've seen in the past?

I would like to point out three basic things.

First of all, we have witnessed this ongoing process of exponential acceleration.

We're all familiar with Moore's Law, but it's actually much broader than that. In many cases, it extends to software, communications, bandwidth, and more.

But the really important thing to understand is that this acceleration has been going on for a very long time.

In fact, it's been around for decades.

If you count from the late 1950s when the first integrated circuits were built, computing power has increased about 30 times since then.

This is just an extraordinary number of doublings of everything, and what this really means is that we are now at a stage where we are seeing an extraordinary amount of absolute progress. And, of course, things will continue to accelerate from this point onwards.

So as we look forward to the years and decades ahead, I think things are going to happen that we're really not prepared for.

We will see things that will surprise us.

Second, machines are beginning to think in a limited sense.

This does not mean human-level AI or sci-fi artificial intelligence. What I mean is that machines and algorithms are simply making decisions.

They are solving problems, and most importantly, they are learning.

In fact, if there's one technology at the heart of this and really driving it, it's machine learning. Machine learning is becoming an incredibly powerful, disruptive, and scalable technology.

One of the best examples of this I've seen recently is what Google's DeepMind division has done with their AlphaGo system.

Well, this is the system that was able to beat the world's best players in the ancient game of Go.

Now, there are two things about Go that really stand out, at least to me.

One is that the number of possible board configurations is basically infinite when playing the game.

In fact, there are more possibilities in the universe than there are atoms.

So what this means is that you can never build a computer to win at, say, Go with a chess-like approach that essentially throws in brute-force computational power.

It is therefore clear that a more sophisticated, thought-like approach is needed.

The second thing that stands out the most is that when I talk to one of the championship Go players, he can't articulate exactly what he's thinking during the game.

It's often very intuitive, like a sense of what movement to do.

So, given these two qualities, playing Go at world champion level should be safe from automation, and the fact that it isn't is really alarming to us.

The reason is that we tend to draw a very clear line, and on one side of that line are basically all the jobs and tasks we perceive as being on a routine, repetitive and predictable level.

And while we know that these jobs may be in different industries, different job titles, and different skill levels, we know that these jobs are predictable in nature and will probably at some point become more susceptible to machine learning and thus automation.

Don't get me wrong. I have a lot of work to do.

But on the other side, there are jobs that require unique human abilities and are considered safe.

Now, based on what I know about the game of Go, I'd speculate that Go should really be on the safe side of that line.

But instead, the fact that Google has solved the problem suggests that this route will be very dynamic.

That will change, and the jobs and tasks we currently perceive as safe from automation will change in increasingly consuming ways.

Another important point to understand is that this is by no means just low-paid or blue-collar jobs, or jobs and tasks performed by people with relatively low levels of education.

Evidence abounds that these technologies are rapidly climbing the skill ladder.

As such, we are already seeing the impact on professionals such as accountants, financial analysts, journalists, lawyers and radiologists.

As such, many of the assumptions we make about the types of jobs, tasks, and jobs that will be threatened by automation in the future are very likely to be questioned going forward.

Taken together, I think these trends indicate a very high probability of significant unemployment in the future.

Or, at the very least, we could face a lot of underemployment and stagnant wages and even lower wages.

And of course, inequality levels soar too.

All of this, of course, puts a lot of stress on the social structure.

But beyond that, there are also underlying economic issues. This occurs because employment is now the primary mechanism for distributing income, and therefore purchasing power, to all consumers who purchase the products and services we produce.

To have a vibrant market economy, there must be a very large number of consumers who can actually buy the products and services being produced.

Without it, there are not enough customers to buy the products and services being manufactured, and the economy risks stagnation or even an economic decline spiral.

It is very important to recognize that all of us as individuals depend on access to the market economy for our success.

You can visualize it if you think in terms of one really good person.

For example, just imagine taking Steve Jobs and dropping him on an island all by himself.

On that island, he intends to run around collecting coconuts like everyone else.

He has no intention of being anything special. The reason, of course, is that there is no market for his great talent.

Access to this market is therefore very important for us personally and for the system as a whole to be sustainable.

So the question is: What can be done about this specifically?

And I think you can look at this through a very utopian framework.

Imagine a future where we all have to work less, have more leisure time, spend more time with our families, spend more time doing the things we truly care about, and so on.

And I think it's a great vision.

That is what we should definitely strive for.

But at the same time, I think we need to be realistic and realize that we are very likely to face serious income distribution problems.

Many people are likely to be left behind.

And to solve that problem, I think we'll eventually have to find a way to separate our income from our traditional jobs.

And the easiest way I know of to make that happen is some kind of income guarantee or universal basic income.

Now, basic income is becoming a very important idea.

It has received a great deal of attention and attention, with many important pilot projects and experiments taking place around the world.

My own view is that a basic income is not a panacea. It's not necessarily a plug-and-play solution, but rather a place to start.

This is an idea that we can build on and improve.

For example, one of the things I have written about many times is the possibility of incorporating explicit incentives into basic income.

To illustrate it, imagine you are a struggling high school student.

Imagine that you are in danger of dropping out of school.

Suppose you know that at some point in the future you will still get the same basic income as everyone else, no matter what.

Now, in my opinion, it creates a very perverted incentive for you to simply give up and drop out of school.

So let's not structure things that way, I say.

Instead, pay someone who graduates from high school a little more than someone who just dropped out.

And the idea of ​​building incentives into basic income could be taken and extended to other areas.

For example, it might create incentives to work to help others in the community, or to do something good for the environment.

So building incentives into basic income could actually improve it, and perhaps at least take some steps towards solving another problem that we are likely to face in the future. It's about how we all find meaning and fulfillment, and how we spend our time in a world where the demand for traditional jobs is probably declining.

So by expanding and improving Basic Income, I think we can make it look better, and perhaps also make it more politically and socially acceptable and feasible – and, of course, doing so will make it more likely that it will actually happen.

I think one of the most basic, almost instinctive objections many of us have to the idea of ​​a basic income and to any significant expansion of the safety net is the fear that there will be too many people riding economy carts and not enough people pulling them.

But my point here is, of course, that in the future machines will pull the carts for us.

It should give us more options for how we structure our societies and economies. And I think eventually it will be more than just an option, it will be a must.

The reason, of course, is that all of this puts a lot of stress on our society, and also because employment is the mechanism that gives consumers purchasing power and drives the economy.

In fact, if that mechanism starts to fail in the future, we will have to replace it with something else, or we will face the risk that the whole system will become unsustainable.

But the bottom line here is that solving these problems, and especially finding ways to build future economies that work for everyone at all levels of society, will be one of the most important challenges facing us all in the years and decades to come.

thank you very much.

(applause)

Most of the time when you walk around where you live, you feel very safe and comfortable.

Imagine if landmines were buried here and there, and they were scattered all over the place.

So do many people in my home country of Colombia.

Five decades of internal armed conflict have left unidentified landmines across the countryside, affecting more than a third of the Colombian population.

These antipersonnel mines are designed to injure, rather than kill, their targets.

The logic behind this is atrocious, but it is that more resources are spent caring for wounded soldiers than dealing with the dead.

I met Adriana Rodriguez about five years ago while working as a documentary filmmaker for the Colombian government.

During the conflict she was forced to leave her home...

Hold the children in your arms.

One day, a neighbor stepped on a landmine and died.

He was actually inside the abandoned house instead of outside. It was the exact same house that Adriana was evicted from.

Since then, she lives in fear that she or her children will step on landmines.

As you know, the conflict in Colombia has been going on for so long that my mother and I have never seen peace in this country. For someone like me, who has lived disconnected from all this suffering, there were only two options. Either you get used to it, or you genuinely try to change this situation.

And I have to admit that for almost 30 years I've grown accustomed to it.

But when I met my wife, something changed in me.

She is a political scientist with a passion for the armed conflict in Colombia.

She has helped us understand how badly our country is affected by landmines and war.

We decided to come here to the United States in search of new skills that will allow us to contribute to society in a fair way and even heal it.

While in graduate school, I started developing augmented reality. A very broad application to help military personnel more safely disable mines.

That's when I realized that Colombia wasn't the only country in the world that had to worry about landmines.

In fact, more than 58 countries are still contaminated with some form of explosive.

Only in 2015 did the number of [landmine casualties] nearly double, from 3,695 to 6,461, due to escalating warfare in countries such as Libya, Syria, Ukraine and Yemen.

Imagine.

Some countries are working to clear mines, while others are increasing their use.

But what happens when conflicts involving mines end?

There are two results.

On the one hand, internally displaced persons will begin to return to their lands, and on the other hand, hidden landmines will begin to detonate more frequently on the civilian side.

That's why I decided to join Professor Claudio Silva in the computer science department at New York University and start developing an app called MineSafe.

MineSafe uses information from the community to suggest the routes declared to be the most passable without accidents or incidents caused by mines.

These traffic patterns can also be used to determine priority zones for demining.

About 15 million people currently live in rural Colombia.

Imagine for a moment. What if we could crowdsource information from all of them to help people like Adriana and her children find a safe and trusted path?

This information is not just for that purpose.

This information can also help you improve your productivity.

Farmers can find land that has been cleared of explosives so they can find new fertile land to start growing food again.

MineSafe is currently partnering with the Colombian government for early pilots and has some connections with Cambodia and Somalia.

This project is funded by private money here in the US, but we don't want to stop here.

We want to work on a large scale and we want to expand our projects to all places where the mine threat still exists.

The armed conflict in Colombia is finally coming to an end, but the effects of years of war are still buried under our feet.

We at MineSafe are committed to helping both people and land find peace.

thank you.

(applause)

Every movie ever made can fit inside this tube.

If you can't see it, that's the point.

(Laughter) Before we understand how this is possible, it's important to understand the value of this feat.

All of our thoughts and actions these days through photos and videos, even our fitness activities, are digitally stored.

Aside from running out of cell phone storage, we rarely think about our digital footprint.

But in recent years, humans have collectively generated more data than in all of human history.

Big data has become a big problem.

Digital storage is very expensive and none of these devices we own really stand the test of time.

There is a non-commercial website called the Internet Archive.

Access free books and movies, plus web pages dating back to 1996.

Now, this is very tempting, but I decided to take a look back at the very humble beginnings of the TED website.

As you can see, much has changed in the last 30 years.

So I went to the first TED in 1984. There happened to be a Sony executive explaining how CDs work.

(Laughter) Now, to be able to go back in time and access this moment is absolutely unbelievable.

It's also very interesting that you're still talking about digital storage, 30 years after your first TED.

Now, look back another 30 years and IBM released the first hard drive in 1956.

Here, shipments are being loaded in front of a small audience.

It holds one MP3 song and weighs over a ton.

At $10,000 per megabyte, I don't think anyone in the room would be interested in buying this, except perhaps as a collector's item.

But that was the best we could do at that point.

We have made great strides in data storage.

Devices have evolved dramatically.

But all media eventually wear out or become obsolete.

If someone handed you a floppy drive as a backup for a presentation today, you'd probably get some weird looks and laughs, but there's no way you could use something like that.

These devices can no longer meet your storage needs, but some can be reused.

All technology eventually disappears or is lost along with its data and memories.

There is an illusion that the storage problem has been solved, but in reality we are all just externalizing the storage problem.

Don't worry about saving emails or photos.

They are really in the clouds.

But behind the scenes there are problems with storage.

After all, the cloud is just a bunch of hard drives.

Now, you could say that most digital data isn't all that important.

Of course you can also remove it.

But how do you know what really matters today?

We have learned a lot about human history from the pictures, letters and stone tablets in the cave.

We deciphered the language from the Rosetta Stone.

However, we never really know all the stories.

Our data is our story, and more so today.

Our records are never set in stone.

But we don't have to choose what is important now.

There is a way to keep it all.

It turns out that the billion-old solution is indeed inside this tube.

DNA is nature's oldest memory device.

After all, it contains all the information necessary to build and maintain a human being.

But what makes DNA so good?

Well, let's take our own genome as an example.

If you printed all three billion A's, T's, C's, G's in standard fonts, standard formats, and stacked them all together, they would be about 130 meters tall, somewhere between the Statue of Liberty and the Washington Monument.

Now, if you convert all those A's, T's, C's, and G's into digital data, ie 0's and 1's, you add up to several gigabytes.

And it is in each cell of our body.

We have over 30 trillion cells.

It turns out that DNA can store a large amount of information in a very small space.

DNA is also very durable and does not require electricity to store.

We know this because scientists recovered DNA from ancient humans who lived hundreds of thousands of years ago.

One of them is Ötzi the Iceman.

I found out that he is Austrian.

(Laughter) He was found in a well-preserved highland, in the mountains between Italy and Austria, and turned out to have genetic relatives now living here in Austria.

So it's possible that one of you is Otzi's cousin.

(Laughter) The point is, you're more likely to recover information from ancient humans than you are to recover information from old cell phones.

It's also much less likely to lose the ability to read DNA than a single artificial device.

Each new storage format requires a new way to read it.

We will always be able to read our DNA.

Losing ordering is a bigger problem than worrying about data storage.

Storing data about DNA is not new.

Nature has been doing it for billions of years.

In fact, every living thing is a storehouse of DNA.

But how do we store data about DNA?

It's photo 51.

This is the first ever photo of DNA taken nearly 60 years ago.

This was around the time the same hard drive was released by IBM.

In short, our understanding of digital storage and DNA have evolved simultaneously.

We first learned to sequence DNA, or read it, and soon after learned how to write it, or synthesize it.

This is very similar to how we learn new languages.

And now we have the ability to read, write and copy DNA.

We do it in the lab all the time.

So anything that can be stored as zeros and ones can be stored in DNA.

To store something digitally, like this picture, you convert it to bits, or binary numbers.

Each pixel in a black and white photo is simply a 0 or a 1.

And just like an inkjet printer prints letters on a page, you can write your DNA.

Just convert the data (all the 0's and 1's) to A, T, C, G and send this to the synthesis company.

So just write the data, store it, and sequence it when you want to recover the data.

Now, the fun part of all this is deciding which files to include.

Since we are serious scientists, we needed to include the manuscript for posterity.

Also included was a $50 Amazon gift card. Don't get too excited. I have already run out. someone deciphered it. It also included an operating system, one of the first movies ever made, and a Pioneer nameplate.

Some of you may have seen this before.

It depicts a typical—apparently—male and female, and their approximate locations in the solar system, in case the Pioneer spacecraft encounters extraterrestrial life.

Once you've decided what kind of file you want to encode, all you have to do is package the data, convert those 0's and 1's to A's, T's, C's and G's and send this file to the synthesis company.

And this is what we came back for.

Our files were in this tube.

All we had to do was sequence it.

This all sounds pretty easy, but the difference between a really cool and fun idea and one that you can actually use is if you can overcome these practical challenges.

Well, DNA is more robust than any artificial device, but it's not perfect.

It has some weaknesses.

We recover the message by sequencing the DNA, but every time we get the data, the DNA is lost.

It's just part of the sequencing process.

We don't want to run out of data, but fortunately there are ways to copy DNA that are even cheaper and easier than synthesizing it.

We actually tested the method to create 200 trillion copies of files and recovered all data without any errors.

Sequencing therefore introduces errors into the DNA, ie A, T, C, G as well.

Nature has a way of dealing with this within our cells.

However, since our data are stored on synthetic DNA in tubes, we had to find a unique way to overcome this problem.

I decided to use the algorithm used for streaming video.

When you stream a video, you basically try to recover the original video, i.e. the original file.

When you're trying to recover the original file, you're simply running the sequence.

But in reality both of these processes aim to recover enough 0's and 1's to get the data back.

And thanks to our coding strategy, we were able to make millions and trillions of copies and still package all the data in such a way that we could always recover all the files.

This is the encoded movie.

It's one of the first movies ever made and the first to be copied over 200 trillion times on its DNA.

Shortly after our work was published, we participated in the website reddit "Ask Me Anything".

If you're a geek, you're probably familiar with this website.

Most of the questions were thoughtful.

Some were comical.

For example, one user wanted to know when literal thumb drives were coming.

Now, the problem is that our DNA already stores everything we need to form us.

Data about DNA is much safer to store on synthetic DNA in tubes.

Obviously, writing and reading data to DNA is currently much slower than storing all your files on your hard drive.

Therefore, you should initially focus on long-term storage.

Most data is temporary.

It is very difficult to grasp what is important now, or what will be important to future generations.

But the point is, you don't have to decide today.

There is a wonderful program called the "Memory of the World" program by UNESCO.

It was created to preserve historical material that is considered of value to all of humanity.

Items are nominated to be added to the collection, such as movies we have encoded.

It's a great way to preserve humanity's legacy, but it doesn't have to be a choice.

Instead of asking the current generation, us, what will matter in the future, we can store it all in our DNA.

Storage isn't just about bytes, it's about how much data you can actually store and restore.

There was always a tension between how much data could be generated, how much data could be recovered, and how much could be stored.

Every advance in writing data required a new way to read it.

Old media is no longer readable.

Floppy drives aside, how many of us have disk drives in their laptops?

Not so with DNA.

As long as we exist, DNA will exist and we will find a way to sequence it.

Archiving the world around us is part of human nature.

This is the progress made in digital storage in 60 years when we were just beginning to understand our DNA.

But DNA sequencers have made similar progress in half that time, and DNA will never go out of fashion as long as we exist.

thank you.

(applause)

Emissions must be cut rapidly to avoid dangerous climate change.

Certainly for this audience it should be a pretty uncontroversial statement.

However, there is something a little debatable here. That's not enough.

We will digest 1.5 degrees of the remaining carbon budget within a few years, and 2 degrees in about 20 years.

Not only do we need to reduce emissions very rapidly, we also need to remove carbon dioxide from the atmosphere.

thank you.

(Laughter) I'm evaluating all of these suggested techniques to see if they work.

We can use plants to capture CO2 and store it in trees, soil, deep underground, or in the ocean.

It may be possible to build large machines, so-called artificial trees, that remove carbon dioxide from the air.

For these ideas to be viable, we need to understand whether they can be applied at scale in a safe, economically and socially acceptable way.

All of these ideas come with trade-offs.

None are perfect, but many have potential.

It is unlikely that any of them will resolve alone.

There is no silver bullet, but potentially combining them could form the silver bullet needed to stop climate change.

I am working independently on one particular idea of ​​using natural gas to generate electricity in a way that removes carbon dioxide from the air.

teeth? how does that work?

There, the Origen Power Process supplies natural gas to the fuel cell.

About half of the chemical energy is converted to electricity and the rest is converted to heat and used to split limestone into lime and carbon dioxide.

At this point, you're probably thinking I'm crazy.

It actually produces carbon dioxide.

But the point is that all carbon dioxide produced from both fuel cells and lime kilns is pure. This is very important. Because it means that carbon dioxide can be harnessed or stored deep underground at low cost.

And the lime produced can be used in industrial processes, removing CO2 from the air when used.

Overall, the process is carbon negative.

Removes carbon dioxide from the air.

Normally, generating electricity from natural gas releases about 400 grams of CO2 into the air for every kilowatt hour.

This process reduces this number to minus 600.

Power generation currently accounts for about a quarter of our total carbon footprint.

If we replaced all power generation with this process, we would not only eliminate all emissions from power generation, but we would also start eliminating emissions from other sectors, potentially reducing our overall carbon emissions by 60%.

Lime can also be added directly to seawater to combat ocean acidification, another problem caused by atmospheric carbon dioxide.

In fact, you get even more value for your money.

Adding carbon dioxide to seawater absorbs about twice as much carbon dioxide as industrial use.

But this is where it gets really complicated.

Combatting ocean acidification is a good thing, but we don't fully understand what the environmental impacts are, so we need to assess whether this treatment is actually better than the disease we're trying to treat.

To assess this safely, we need to put in place gradual governance over the experiments.

And the scale will need to remove trillions of tons of carbon dioxide from the atmosphere in the coming decades to avoid dangerous climate change.

That would cost a few percent of GDP - think defense-scale spending, massive industrial activity, and inevitable harmful side effects.

But if the scale seems huge, it's simply because the problem we're trying to solve is huge.

It's huge too.

We can no longer avoid these pesky problems.

Whether the world is changed by climate change or by climate change and efforts to combat it, we face risks either way.

I wish it wasn't, but we can no longer afford to close our eyes, cover our ears, and la-la-la.

We have to grow up and face the consequences of our actions.

(Applause.) Does talk of fixing climate change undermine the will to cut emissions?

This is a real concern and we need to stress the paramount importance of reducing emissions and how speculative these ideas are.

But even if you did that, you still need to look them up.

Can we fix climate change?

I don't know, but you definitely can't if you don't try.

We need ambition without arrogance.

We need the ambition to restore the atmosphere and capture carbon dioxide to levels compatible with a stable climate and healthy oceans.

This will be a big undertaking.

You could call it a cathedral project.

The original parties can draw up a plan and dig the foundation, but not raise the spire to its maximum height.

That duty, that privilege belongs to our descendants.

None of us can see that day, but we must begin with the hope that future generations will be able to complete the task.

So do you want to change the world?

I don't

I don't want the world to change, but rather to keep it the way it should be.

thank you.

(Applause) Chris Anderson: Thank you. I have a few more questions.

Tell us a little more about this idea of ​​throwing lime into the sea.

So, on the surface, it's a very compelling case of preventing ocean acidification and absorbing more CO2.

As you said, you'll have to experiment with this.

What does responsible experimentation look like?

Tim Kruger: So I think you have to do a series of experiments, but in very small steps.

Similarly, when conducting a clinical trial of a new drug, we do not immediately start clinical trials on humans.

Let's do a little experiment.

Therefore, the first thing to do is a completely land-based experiment in a special container away from the environment.

And once you're confident it's safe to do so, move on to the next step.

Without confidence, there is no confidence.

But one step at a time.

CA: So who would fund such an experiment?

Because they affect the entire planet on some level.

Is that why nothing happens in this matter?

TK: So, I think we can do small scale experiments in national waters, but that's probably a requirement of the state funders.

Ultimately, however, if we want to globally combat ocean acidification in this way, we will need to do it on the high seas, and the international community will need to work on it.

CA: All oceans are connected, even if they are national waters.

That lime will come out of there.

And as we heard, people resent conducting experiments on Earth.

How do you argue against that?

TK: I think you're touching on something really important.

It's about a social license to operate.

I think it may not be possible, but we need to have the courage to try, move this forward, see what we can do, and be open to it.

And we need to engage with people in a transparent way.

You should ask them in advance.

And I think you have to accept the possibility that if you ask them, they'll say, "No, please don't."

CA: Thank you. It was really charming.

TK: Thank you. (applause)

What I would like to argue with you is that, in fact, politics and religion are two major factors -- not the only ones, but by far the most dominant ones -- that are pushing us toward a highly probable war -- for or against, we are on the verge of inevitability at the moment -- that politics and religion are in fact themselves better conceptualized as a kind of technology, subject to the kind of problems we regularly examine in the realm of conceptual design.

Here's what I mean. Politics -- Let's focus here specifically on the political system, the democratic system.

Democracy, as a form of politics, is the art of controlling and deploying power.

Power can be deployed in a wide variety of ways.

Famously, despotism is a good thing. Anarchy is the method of exercising power in a fundamentally diffuse manner without deploying it in any organized way. And democracy is a set of technologies that, in principle, have the effect of dispersing the sources of power among the many, and then re-centralizing them into the governing few, who themselves, in principle, are empowered to govern by what the wider population has done.

Now let's think about religion. In this case Islam. Islam is, in some direct sense, a religion that can be said to promote what we are about to enter.

Let me state in brackets why I think so. Because I think this is a potentially controversial statement.

I fit this into the following equation: No 9/11, no war.

Early in the Bush administration, President Bush (now President Bush) made it clear when he was running for president that he was not interested in broadly intervening in the world.

In fact, it has tended to cut ties with the rest of the world.

That's why we heard about withdrawal from the Kyoto Protocol, for example.

After 9/11, the tables turned.

And the President, along with his advisors, decided to make some positive interventions in the world around us.

It started with Afghanistan, and when Afghanistan went very smoothly and quickly, through democratic technology, notice again, not perfect technology, the decision was made through democratic technology that this administration would push in the direction of another war, this time the war in Iraq.

Now, the reason I begin to say "against 9/11 and no war" is that I must admit that Islam, as interpreted by a very small, very radical group of people, is the catalyst for the 9/11 attacks and, in part, the coming wars that we are about to engage in.

And I would add that bin Laden and his followers are consciously committed to the goal of creating a conflict between democracy, or at least capitalist democracy, and the Islamic world as they perceive and define it.

Now, how does Islam become technology in this conceptual apparatus?

Well, this is first and foremost a technology for salvation in the most basic sense.

It is intended to be a mechanism for interpreting the universe in such a way as to bring salvation to the individual believer, but is also meant by Islamists. And I use this term to mean those who believe in Islam. They follow the slogan that Islam is the answer to a wide range of questions, whether social, political, personal or spiritual.

Among those who hold such a view is the large number of people in the Muslim world who disagree with bin Laden's claim but agree that Islam is the answer.

Islam represents a way of engaging with the world to achieve certain desired goals.

And from a Muslim point of view, the standard is peace, justice and equality as a rule, but the conditions are consistent with traditional Islamic teachings.

Now, I don't want to leave a misunderstanding by identifying either of these propositions, or rather the phenomenon of democracy or Islam, as technology.

I do not mean to say that they can be pointed out as a single thing.

And I think a good way to prove this is to simply show my thought process when deciding what to put on the wall behind me when I speak.

And I immediately ran into a conceptual problem. It is not possible to show the whole picture of democracy.

You can display slogans, symbols, and signs that represent democracy.

I could show you the Capitol -- in fact, I had the same problem when I was designing the cover for my upcoming book -- what would you put on the cover to show democracy?

And with Islam we have the same problem.

You can show a mosque, you can show a worshiper, but there is no easy way to portray Islam.

Because these are the kinds of concepts that cannot be easily expressed.

Well, from this we can see that they are very controversial.

Hence, all the peoples of the world who claim to be Muslims can, in principle, accept a wide range of different interpretations of what Islam really is, and the same is true of democracies.

In other words, unlike the word "hope", whose etymology can be derived by consulting dictionaries and possibly arriving at some consensual analysis of its use, these are inherently contentious concepts.

These are ideas that people disagree with in the deepest sense possible.

And as a result of this disagreement, it is very difficult for anyone to say, "I have the right Islam."

As you know, after 9/11 we were met with an astonishing phenomenon where George W. Bush said, "Islam means peace."

So did George W. Bush.

Others will say it means something else.

Some say Islam means submission.

Others will say that it means the recognition or recognition of God's sovereignty.

Islam has many meanings.

And ostensibly, the same applies to democracy.

Some say that democracy is basically made up of elections.

Some say no, that's not enough, there must be basic liberty rights like freedom of speech, freedom of the press and equality of citizens.

These are moot points, and impossible to answer by saying, "Oh, I looked in the right place and now I know what these concepts mean."

Now, if Islam and democracy are currently in a moment of great conflict, what does that mean?

Well, you can also put it into different frameworks of interpretation.

You can start with the fear that started a few days ago.

Fear is not the reaction of disbelief that war is on the horizon and that so many people are very likely to die as a result of this conflict. This conflict is something many people in the Islamic world don't want, many people in American democracy don't want, many people in other parts of the world don't want, and yet there are enough people, at least in the relevant spheres, namely the United States, who support it to actually move forward. So fear is not a crazy reaction at all.

And in fact, I think that's probably the first appropriate response.

However, what I want to suggest to you in the next few minutes is that there is also a hopeful response to this.

And the hopeful response comes from the realization that Islam and democracy are technology.

And being technology, they are operational.

And they can be manipulated in ways that can produce very positive results.

what am i thinking

Yes, there are people all over the Islamic world who take Islam very seriously, who care about Islam as a source of faith, a source of civilization, or a source of deep values, or just a strong source of personal identity, and who think and speak out that Islam and democracy are not in fact contradictory, but in fact deeply compatible.

And these Muslims, and the majority of Muslims, vehemently disagree with bin Laden's approach.

And they also think overwhelmingly -- again, I can't speak for everyone, but overwhelmingly, you can see this if you read the sources they have created, which are on the Internet and are written in all sorts of languages ​​-- and you find them saying that their interest in their country is primarily to give them freedom of choice in the sphere of personal life, the economic sphere, the political sphere, and yes, the religious sphere. Islamic world.

And many of these Muslims also say their disagreement with the United States is that the United States has, and still does, side with the authoritarian rulers of the Islamic world to advance its short-term interests.

Now, during the Cold War, that may have been a defensible position for the United States.

It's an academic question.

Perhaps there was a great war between the West and the East, and it was necessary on the axis of democracy against communism.

And these have to contradict each other in some way and consequently have to make friends wherever they can get them.

But now that the Cold War is over, there is a near-universal consensus in the Muslim world, and if you talk to or listen to people, there is almost no reason why democracy and Islam cannot coexist in principle here in the United States.

And this is also seen among activist and practicing Muslims, such as the Muslims, who are currently Turkey's elected parliamentary democratic government, who act practically rather than ideologically, who promote their religious values, who are elected by their own people because they are seen as honest and sincere because of their religious values, but who do not consider Islam and the democratic system of governance fundamentally incompatible.

Now, you might say so, but certainly what we see on TV about Islam in Saudi Arabia convinces us that it cannot be compatible with what we think of as the heart of democracy: free political choice, basic freedoms, and basic equality.

But my point here is that technology is much more flexible than that.

What I want to tell you here is that a very large number of Muslims believe – in fact, the majority – and I would even go so far as to say that many Muslims in Saudi Arabia believe that the core values ​​of Islam, namely the recognition of God's sovereignty and the basic equality of man before God, are in themselves compatible with freedom, equality and free political choice.

And there are Muslims, many Muslims, saying exactly this.

And they are having this discussion wherever they are allowed.

But needless to say, their government is relatively threatened by this.

And most of the time I try to stop them from having these discussions.

So, for example, a group of young Egyptian activists are trying to form a political party known as the Center Party, which advocates compatibility between Islam and democracy.

They weren't even allowed to form a party.

In fact, they were even prevented from forming a political party under the political system there. why?

Because they should have done very well.

In recent elections in the Islamic world, in Pakistan, Morocco and Turkey, in each case those who identified themselves as Islamic democrats in their electors won overwhelmingly the most votes wherever they were free to stand.

Morocco, for example, finished third in the political elections, but was only able to contest half of the seats.

Therefore, if they had contested for more seats, they would have done even better.

Now, what I would like to suggest to you is that the reason there is hope in this matter is that we are on the brink of real change in the Muslim world.

And it is a transformation that many faithful Muslims - people who hold their traditions so deeply and unwilling to compromise those values ​​- believe that these two ideas can work together through the technological adaptability of democracy and the technological adaptability and synthesizing capacity of Islam.

So what will it be like?

What does it mean to say there is an Islamic democracy?

Well, one thing is for sure, it doesn't look the same as democracy as we know it in the US.

This may be a good thing considering some of the criticisms we hear today, such as the regulatory context of what democracy produces.

It also would not be exactly the same as conceptualizing Islam, neither for the people in this room nor for Muslims in other parts of the world.

It will also bring about changes in Islam.

And this convergence, a synthetic attempt to understand these two ideas together, may result in not a clash between Islamic and democratic civilizations, but indeed a closer compatibility.

Now, I started talking about war because it's the elephant in the room, and if you're talking about these issues, you can't pretend war isn't coming.

War is fraught with great risks for the model I am describing. Because as a result of the war, many Muslims will very likely conclude that the United States is not the kind of place they want to emulate in terms of its political form.

On the other hand, it is more likely that many Americans, drowning in the heat of war, will come to say, feel, and think that in some way Islam is, or should be interpreted as, the enemy.

And while presidents have been very good at saying that Islam is not the enemy, for political tactical reasons, nevertheless, when you go to war, there is a natural compulsion to see your opponent as the enemy.

And then there is also the urge to generalize as much as possible in defining who that enemy is.

So the risks are huge.

On the other hand, the ability to have positive consequences in the aftermath of war should also not be underestimated, especially for those who are deeply skeptical about whether war should be fought at all.

Opponents of war should realize that after war it is not the right strategy to say, ``Well, let it all take its own course, let it play out as you please, we were against war from the beginning.

The human situation doesn't work like that.

Face the situation in front of you and move forward.

Now, what I want to say here is that it is especially important for war skeptics to recognize that after the war, the U.S. government and its Muslim allies could create a truly democratic and truly Islamic form of government.

And for those concerned with these issues, it is vital to ensure that they exercise their preferences, choices and voices within the technology of democracy, within this system, to promote that outcome.

This is a message of hope, but it will only be a message of hope if we understand that it is a grave obligation for all of us.

And I think we can meet that obligation, but only if we put our full effort into it.

And if they do, I don't think that hope is wholly unjustified.

thank you.

By 1973, Harvey Milk was already a naval officer, high school teacher, bit actor, and wandering hippie.

But when he started his new life running a camera store in San Francisco, he found himself already distracted.

From the Watergate hearings that made national news, to the teacher who had to rent a projector when his school couldn't afford one, Harvey felt a desperate need for political reform.

Milk strongly believed that close-knit districts were integral to the fabric of cities and that governments needed to solve the most practical problems of those communities.

Milk envisioned a more personal approach to local government, from repairing holes and installing stop signs to promoting a culture of friendly cooperation.

This philosophy led him to run for the city's board of supervisors to represent his district, including the Castro, the epicenter of gay culture in America.

At the time, police brutality, discrimination and media stereotypes plagued the LGBT community, labeling Harvey and his supporters political outsiders.

However, Milk refused to downplay his sexuality.

He was convinced that gay rights could never be won in the closet, and that Castro was one of many minorities who had no representation in city government.

Milk was determined to provide these basic government services to all disenfranchised groups in San Francisco, regardless of race, age or sexuality.

But despite his public speaking talents and outspoken approach, voters failed to understand Milk's radical vision.

In 1973 he lost his first candidacy to the Supervisory Board.

In 1975 they lost again.

A year later, he ran for the California legislature, but was unsuccessful.

Still, he continued to vigorously support the district, making friends with bartenders, a construction workers' union, and a local Chinese grocer.

This earned him the affectionate title of "Mayor of Castro Street". And in 1977, when he campaigned for the third time on the oversight board, Harvey finally won a seat and became one of the first public officials in U.S. history to be openly gay.

Milk was overjoyed and arrived at the office determined to make a lasting change.

He soon introduced a bill outlawing discrimination on the basis of sexuality and initiated a massive cleanup of the city.

However, not everyone was happy with this direction.

Anti-homosexual sentiment was gaining momentum nationwide, especially in the form of Proposition 6 in California.

The proposal to make it illegal for gays to work in California schools would be the biggest battle of Milk's career.

Supporters of Prop. 6 attacked the LGBT community, saying they were unfit to work with students.

But Ms. Milk advised not to hide in fear. "Come out to your relatives.

If you're really friends, come out to them.

Speak up to your neighbors and colleagues... break the myths.

Defeat the lies and distortions.

for you. for them. He, along with other activists, launched a fevered campaign against hate.

On 7 November 1978 Prop 6 was defeated in a landslide.

It was proof that Milk's message was getting attention.

However, just 20 days after this electrifying victory, he was assassinated at City Hall, murdered along with San Francisco Mayor George Moscone.

Both were murdered by former fellow director Dan White. Dan White was hostile to what he called "extremists, deviants, and hopeless people." He frequently clashed with Harvey at board meetings and resented the spirit of change that Milk embodied for many.

Thousands marched through the city by candlelight on the night Ms Milk was killed.

In the aftermath of this tragedy, yet another injustice arose.

In a highly controversial verdict, White was sentenced to just seven years and eight months in prison, but the sentence later became known as the White Nights Riot and caused an uproar throughout the city.

But even after his death, Milk continued to preach a hopeful cause.

He left his friends and followers a total of three different tapes to play during the assassination.

They leave us with a call to action and a reminder that everyone is welcome to fight injustice. “I ask for continued exercise…and if a bullet penetrates my brain, please let that bullet destroy every closet door…”

A few years ago, this always happened, especially at family gatherings such as tea parties with my aunts and uncles.

When people come up to you and ask, "So what are you doing?"

And I will answer with a magic word that makes everyone happy. "It's medicine."

I am going to become a doctor. ”

It's so easy, that's all, everyone happy and satisfied.

It could be so simple, but this effect really only lasts for 30 seconds for me. Because when the time comes, one of them will ask, "So what branch of medicine?"

What field would you like to specialize in? ”

And I honestly had to undress and just say, "Okay, so I'm fascinated by the colon."

It all started in the anus and now it's basically the entire intestinal tract. ”

(Laughter.) And this is the moment when the enthusiasm drops, and perhaps the moment when the room becomes embarrassingly quiet. I would find this very sad, because I believe our gut is so fascinating.

(Laughter) And in an era where a lot of people are trying to make new superfood smoothies and thinking gluten is bad for them, it seems like very few people actually care about the organ where this happens and the specific anatomy and the mechanisms behind it.

And sometimes it seems like we're all trying to figure out this magic trick, but no one checks the magician. Just because you have embarrassing hairstyles, for example, or just for that reason.

And indeed, there's a reason science has hated the gut for so long. I have to say this.

So it's complicated.

It has a very large surface area, about 40 times the area of ​​the skin.

And in such a tight-knit pipe, so many immune cells are trained there.

We have 100 trillion bacteria doing all sorts of things, producing small molecules.

In addition, we have about 20 different hormones, so we are at a completely different level than, say, our reproductive organs.

And our gut nervous system is so complex that if we cut a piece out, it's independent enough that when we poke it, it mumbles back to us in a friendly way.

(Laughter) But at least these reasons are also why it's so compelling and important.

It took me three steps to love my gut.

So follow these three steps today.

In the beginning, it's just an idea, and it goes on and on.

"Why do you have to look so weird sometimes?"

And really, it wasn't me who asked these first kinds of questions, but my roommate.

After one night of intense partying, he came into our roommate's kitchen and said, "Julia, you're studying medicine. How does poop work?"

(Laughter) I also studied medicine, but I had no idea, so I had to go to my room and look it up in different books.

And then I thought I had found something interesting.

So it turns out that we don't just have an external sphincter, we also have an internal sphincter.

The lateral sphincter is something we all know, we can control, we know what's going on there. The inner ones are really not.

That is, if there are leftovers from digestion, they are sent inside first.

This inner one reflexively opens and briefly passes through for testing.

(Laughter.) So there are sensory cells that analyze what is sent to them. Is it a gas or a solid?

And this information is sent to our brain, and this is the moment our brain realizes, "Oh, I have to go to the bathroom."

(Laughter) The brain then uses its amazing awareness to do exactly what it's meant to do.

He mediates with those around him and says, "So, I tried to find out.

We're at this TEDx conference -- "(laughter) (applause) gaseous?"

Perhaps if you sit on the side and know you can do it quietly.

(Laughter) But it's solid -- maybe later.

(Laughter) Our lateral sphincter muscles and our brains are connected to neurons, so they coordinate, work together, and get us back in line. (Laughter) Other times, like when I'm sitting at home on the couch, I'm free to go out and not have anything else to do.

(Laughter) We humans are actually one of the few animals that does this in such a sophisticated and clean way.

To be honest, I have a newfound respect for how a nice guy with an inner sphincter, unconnected to the nerve to care too much about the outside world and time, cared about me for once.

I thought that was a good thing.

And I used to not really like public restrooms, but now I can go anywhere. Because when your inner muscles add suggestions to your daily schedule, it makes you think more about the bathroom.

(Laughter) And I also learned one more thing. It's that by looking more closely at what I might have been avoiding, perhaps the weirdest part of myself, I've become less fearful and more appreciative of myself.

In fact, when I look at my gut, I think this happens many times.

It's like those funny rumblings that happen when you're in a group of friends or at a conference table in the office.

It's not because you're hungry.

This is because our small intestine is actually very clean and it takes time to clean everything out during digestion. As a result, its eight meters of gut, seven of which are actually very clean, barely smell.

To accomplish this, it creates a powerful muscle wave that propels whatever is left over after digestion.

This may cause sound, but it doesn't have to happen all the time.

In other words, what we think is embarrassing is actually a sign that we are tidying up on the inside.

Or this strange, curved stomach shape is a little Quasimodo-ish.

This allows you to put pressure on your abdomen without vomiting, such as when you are laughing or playing sports. This is because the pressure rises rather than laterally.

This results in air bubbles that are always very visible, for example on X-rays, but if the air bubbles become too large, they can cause discomfort and even pain in some people.

But for most people, it just turns out that sleeping on your left side is much easier to burp than sleeping on your right side.

And soon, I took it one step further and started looking at the bigger picture of our bodies and health.

Actually, it was after I heard that someone I knew a little bit committed suicide.

I happened to be sitting next to him the day before, and he had bad breath.

And when I found out about the suicide the next day, I thought: could the gut have something to do with it?

I started searching frantically to see if there was any scientific paper on the gut-brain connection.

And to my surprise, I found a lot.

Perhaps it turns out to be not as simple as we sometimes think.

We tend to think that the brain issues these commands, sends them to other organs, and all organs need to hear.

But in reality, more than 10 percent of the nerves that connect the brain to the gut carry information from the brain to the gut.

This is what we know, for example, in stressful situations, when transmitters from the brain are sensed in the gut, it tries to turn all the work down, not working, depriving it of blood and energy, and saving energy for problem-solving.

This can extend to nervous vomiting and nervous diarrhea to get rid of food you don't want to digest.

Perhaps more interestingly, 90% of the gut-brain nerve fibers carry information from the gut to the brain.

If you think about it for a second, it makes sense. Because our brains are very isolated.

It's in this bony skull surrounded by thick skin, and it needs information to put together a sense of, "What's going on with my body as a whole?"

And indeed, the gut is perhaps the brain's most important advisor. The gut is our largest sensory organ, gathering information not only about the quality of nutrients, but also about how so many immune cells are functioning, or what hormones the gut can sense in the blood.

And this information can be packaged and sent to the brain.

Areas like the visual cortex and word formation may not be reached there. Otherwise, you will see strange colors and make strange sounds when digesting. no.

But it can reach areas such as morality, fear, and the processing of emotions, or the realm of self-awareness.

So it's no surprise that our bodies and brains put together a sense of, "How am I doing, as a whole?"

The gut has something to contribute to this process.

It also makes sense that people with conditions such as irritable bowel syndrome and inflammatory bowel disease are at higher risk for anxiety and depression.

I think this is good information to share. Because a lot of people think, 'I have gut issues and I might have mental health issues as well.

And maybe it's really just our brains empathizing with our intuitions, because science hasn't made that clear at this point.

This is yet to be further evidenced until it is actually done.

But just knowing about this kind of research that's going on now can help you in your day-to-day life.

And it allowed me to think differently about my moods and not always externalize too much.

During the day, we often feel that we are both a brain and a screen. We tend to look for answers right there, maybe it's stupid work or neighbors. But in reality, moods can come from within.

And just knowing this helped me when, for example, I sometimes woke up too early and started to worry or let my thoughts cycle.

And I think, "Stop, what did you eat yesterday?"

Are you feeling too stressed out?

Am I eating too late? ”

Then get up and brew a light, digestive tea.

It sounds simple, but I think it worked surprisingly well for me.

Step 3 took me further away from my body and allowed me to understand bacteria in a different light.

The research we do today is creating a new definition of what true cleanliness is.

And it's not the hygiene hypothesis - I think many people probably know this.

That said, it's not really a good thing because people get more allergies and autoimmune diseases when there are too few microbes in the environment because they're constantly cleaning.

So I was aware of this hypothesis and didn't expect to learn much from researching gut cleanliness.

But i was wrong.

It turns out that true cleanliness isn't about killing germs right away.

True cleanliness is a little different.

In fact, 95 percent of all germs on earth are harmless to us. It cannot do harm and does not carry genes that do harm.

In fact, many of them have served us well, and scientists are now studying things like: "Do certain bacteria help cleanse the intestines?"

Do they help our digestion?

Are you eating a lot and still getting fat or lean?

Are other people making us more courageous or more resilient to stress?

You know, there are even more questions when it comes to cleanliness.

And really, I think the key is a healthy balance.

You can't always avoid bad things.

This is simply not possible. There is always something bad around.

So what really happens when you look at a clean gut is that there are enough good bacteria, and there are also bad bacteria.

Our immune system needs bad stuff too, so it knows what it's watching for.

So I had a different perspective on cleanliness, and a few weeks later I gave a talk at a university where I got 1,000 things wrong.

And when I got home, I realized at that moment, "Oh, I made a mistake by 1,000 points."

Oh my god, that's so embarrassing. ”

And when I started thinking about this, I was like, "Wow!"

After a while I said, ``Okay, I made this one mistake, but then I told you a lot of good things, right things, and helpful things, so I think you'll be fine, okay?

that's pretty. ”

And I thought, 'Oh wait.

Maybe I took a deeper perspective on cleanliness. ”

And my theory at this point is that maybe we all do.

You might want to take it a step further than just cleaning your living room and make it something like home hygiene.

Knowing that this is as much about cultivating the good as it is about protecting yourself from the bad has had a very calming effect on me.

In that sense, I think I've been able to tell you mostly good and useful things today. Thank you for taking the time to listen to me.

(applause)

congratulation.

By being here, listening, living and being part of a growing species, you are one of history's greatest winners, the culmination of a success story built over four billion years.

You are one percent of life.

The losers, 99 percent of the species that have ever lived, are dead. Killed by fire, floods, asteroids, predation, starvation, ice, heat, and the ruthless calculation of natural selection.

Your ancestors overcame all these challenges, going back to the early fish.

You are here because there is a golden opportunity made possible by the mass extinction.

(laughs) It's true.

The same goes for your co-winners and relatives.

34,000 types of fish.

How did we get so lucky?

Will we keep winning like this?

I'm a fish paleontologist who uses the big data of the fossil record to study how some species win and others lose.

A living person cannot speak to us. They only know how to win.

Therefore, we must speak with the dead.

How can I make a dead fish talk?

Museums are filled with beautiful fish fossils, but their true beauty is revealed when combined with many ugly and broken fossils and reduced to 1s and 0s.

You can search 500 million years of databases for patterns of evolution.

For example, fish morphology can be coordinated and transformed to reveal key pathways of change and trends over time.

This is the story of the winners and losers of just one significant event that I discovered using fossil data.

Travel back to the Devonian period, 360 million years ago, or six times before the last dinosaurs. strange world.

Armored predators with razor-blade jaws dominated alongside giant fish with arm bones in their fins.

Crab-like fish waded across the ocean floor.

The few stingray fin relatives of salmon and tuna crouched at the bottom of the food chain.

A few early sharks lived offshore in fear.

Your few four-legged ancestors, the quadrupeds, languished in the tropical river plains.

The ecosystem was crowded.

I saw no escape, no chance.

Then the world ended.

(Laughter) No, that's a good thing.

359 million years ago, 96% of all fish species died out during the Hangenberg event, the period of fire and ice.

The crowded world was confused and swept away.

Well, you might think that this is the end of the story.

The mighty have fallen, the meek have inherited the earth, and here we are.

But winning is not so easy.

The few survivors came from many groups, all of which greatly outnumbered the deaths.

They ranged from top to bottom predators, large to small, and saltwater to freshwater.

Quenching was a filter.

It just leveled the playing field.

What really mattered was what the survivors did in the millions of years that followed in that devastated world.

It should have been advantageous to the former champion.

They grew bigger, stored energy, invested in their children, spread across the globe, ate fish, maintained what had always worked, and waited for their time.

However, they only survived for a while and then declined without ever innovating, becoming living fossils.

They got so bogged down in their ways that they are now largely forgotten.

A few patient stingrays, sharks and quadrupeds headed in the opposite direction.

They got smaller, lived faster, died young, ate very little, and multiplied rapidly.

They tried new foods, different houses, strange heads and strange bodies.

(Laughter.) And they took the chance to breed and win the future of 60,000 living species, including yours.

That's why it looks so familiar.

you know their names

Victory is not about chance or an arms race.

Rather, survivors followed a different evolutionary path.

Some achieved incredible success, while others walked like dead fish.

(Laughter) It's just a scientific term.

(Laughter) I'm currently investigating how these paths of victory and defeat repeat themselves over time.

Thousands of dead fish have already been collected in my lab, and many more remain.

However, it is already clear that your ancestors survived the mass extinction and that their reactions thereafter shaped you into who you are today.

What does this imply for the future?

As long as a few species survive, life will resume.

A versatile and lucky person not only makes up for what is lost, but wins in new ways.

It may take millions of years.

thank you.

(applause)

Your timing has made you and your partner the most notorious bank robbers in the West.

Well, you have to take advantage of that timing to break out of jail.

At the appointed time, I walk through the garden near the electric fence.

Your partner flashes the signal and shorts the fence circuit exactly 45 seconds later.

It will automatically reboot after a second or two, but as long as you're moving quickly, you're free to go home.

And then, to my horror, I realized that the clock was broken and I didn't have time to fix it.

With the traffic light approaching, any miscount of 45 seconds will get you fried.

Searching my pockets, I found something that might help. It's the lighter and two fuses we created earlier in the Prison Work program.

Each fuse is a length of combustible twine, designed to burn for exactly one minute by igniting both ends.

The problem is that even though the fuse looks uniform, it doesn't burn evenly. So, for example, if you cut one in half, one might burn longer than the other.

Your partner is about to give the signal and you must act.

How can you time exactly 45 seconds using a fuse and a lighter?

Pause the video and find out for yourself.

Answer with 3 Answer with 2 Answer with 1 The length of the fuse may not tell you anything, but we do know that it takes exactly 60 seconds for the fuse to burn from end to end.

Key insights include: If you trip the fuse on one side and it burns for 30 seconds, the fuse will still stay on for 30 seconds.

If we had started on the other side, we would have been in exactly the same place within 30 seconds.

So if both ends were lit at the same time, it would burn out in exactly 30 seconds.

But how do we time the last 15 times?

It must come from the second fuse.

With a 30 second fuse, you can use the same trick again, doubling the burn rate and lasting exactly 15 seconds.

I found that I could shorten the second fuse by firing one end of it at the same time I fired the first fuse.

At the moment the first fuse blows, the second fuse has 30 seconds remaining.

When you understand all this, you will see a signal from your partner and immediately start to act.

Collect the four ends of the two fuses and light three of them.

At the moment the first fuse blows, it fires the other end of the second fuse.

When it blinks and stops, you know exactly 45 seconds have passed and the electric fence has stopped.

By the time you hiccup and get back on track, you're free to go home over the fence.

Architecture, apart from keeping the rain out and creating usable space, is nothing but a machine of special effects that delights and confuses the senses.

Our work spans the media. Works come in all shapes and sizes.

Small and big. This is an ashtray and a water glass.

From urban planning and master plans to theater and all sorts of things.

What they all have in common is that they question assumptions about cosmic conventions.

And these are everyday conventions, so obvious that we are blinded by their familiarity.

And I've gathered samples of work that share a certain productive nihilism used to create certain special effects.

And it's like nothing or nothing.

It does so through a kind of subtraction, blockage, and interference in the world we naturally sleepwalk through.

This is the image that won the exhibition pavilion competition at the 2002 Swiss Exposition on Lake Neuchâtel near Geneva.

And we wanted to use water not only as a backdrop, but also as a primary building material.

We wanted to create an architecture with atmosphere.

So no walls, no roof, no purpose, just atomized water blobs and big clouds.

And this proposal is a response to the oversaturation of emerging technologies at the recent national and international expositions that have fed, or continue to feed, our insatiable appetite for visual stimulation through ever-greater digital feats.

In our opinion, high definition has become the new orthodox.

And we ask the question, can we use technology, high technology, to create an expo pavilion that defies conventions of space and skin and rethinks our reliance on vision, at decidedly low resolution?

So we searched for a way to make it happen.

Water is pumped from the lake, filtered and jetted into a fine mist through an array of 35,000 high-pressure fog nozzles. And a weather station is on top of the structure.

It reads the changing conditions of temperature, humidity, wind direction, wind speed and dew point, and processes this data in a central computer to adjust the degree of water pressure and overall water distribution.

It's also a highly responsive system trained on real-world weather.

So this is under construction, but it has a tensegrity structure.

It's about 300 feet wide, about the size of a football field, and stands on four very delicate pillars.

These are fog nozzles, interfaces, basically the system reads the real weather and produces semi-artificial real weather.

So we are very interested in creating weather. i don't know why

Now, let's look at the quality of space from one side, the outside, and the inside.

Unlike entering a normal space, entering Blur is like stepping into a habitable medium.

It has no shape, no feature, no depth, no scale, no mass, no purpose, no dimension.

All references are erased, leaving only the optical whiteout and white noise of the pulse nozzle.

In other words, this is an exhibition pavilion where there is nothing to see and nothing to do.

And we are proud of it. This is a spectacle of anti-spectacle that turns all spectacle conventions upside down.

So the audience is dispersed, and all the focused attention and dramatic climaxes and climaxes are replaced by a kind of attention deficit maintained by a sense of anxiety caused by the fog.

This is much like how Victorian novels used fog in this way.

So the focus here is not on the world, but on our visual addiction.

As you know, the public, once disoriented, can actually climb onto the deck of the upper angel and descend from under its lips onto the water bar.

So, with all the water in the world provided there, we figured we could also drink this building after being on the water, moving in the water, breathing the water.

It's kind of a theme, but it goes a little deeper than that.

We wanted to derive this absolute reliance on the master senses and perhaps share some of our senses with others.

You know, it was kind of a tough sell when we did this project. Because the Swiss said, 'Why spend $10 million to create effects that already exist in a natural environment that we hate?'

And you know, we thought -- well, we tried to convince them.

And in the end they adopted this as a national symbol that came to represent the Swiss suspicion, but we made it more like a machine of meaning that everyone ignored their own.

Either way, it's a temporary structure that was eventually destroyed, so it's actually a haunted memory, but it lives on in edible form.

And having a chocolate bar is the highest honor that can be given to a Swiss architect.

Anyway, let's move on.

As such, in the 80's and 90's he was primarily known for his independent work as an installation artist, architect and commissioned projects for museums and non-profit organizations.

And we did a lot of media-related work and a lot of experimental theatrical projects.

In 2003, the Whitney Museum of American Art hosted a retrospective of our work, much of it from the 80's and 90's.

But the work itself defies the very nature of the retrospective, and this is only a fraction of what was on display at the show.

This was an article about tourism in America.

It's a "soft sell" on 42nd Street.

This was done at the Fondation Cartier.

MOMA's "Master/Slave", project series, "Parasite".

And there were really a lot of projects of this kind.

Anyway, they let us rent the entire 4th floor. And, you know, the retrospective issue was one that made us very uncomfortable.

This is a kind of museum invention, intended to give the public a kind of coherent understanding of a series of works.

And our work doesn't really resolve as a body in any way.

By the way, one of the recurring themes in this piece was a certain hostility towards the museum itself, questioning museum conventions like walls and white walls.

So what you see here is basically the plan for the many installations that were set up there.

And, in fact, I had to put up a white wall to separate those parts that don't belong together.

However, this white wall was also a kind of target and a weapon at the same time.

We used walls to separate the project's 13 installations, creating a kind of acoustic and visual separation.

And what you're seeing -- in fact, the red dotted line shows the trajectory of this performance factor. This was a new piece of work that we created -- we built for this -- a robotic drill. It basically circled the museum, circled the walls, and did a lot of damage.

So I attached a drill to this robot arm.

By the way, we worked with Honeybee Robotics. This is the brain.

Honeybee Robotics designed the Mars Driller. It was really a lot of fun working with them.

While they were helping us with our work, they weren't doing what they were supposed to do for the government.

Either way, the way it works is that the intelligent navigator basically maps the entire surface of these walls.

So when unfolded it will be about 300 straight feet.

Then randomly generate points in a 3D matrix.

Pick a point, guide the drill to that point, penetrate the drywall, and leave a 0.5 inch hole before moving to the next location.

Initially, these holes were isolated wounds, but as the exhibit continued they began to pierce the walls.

As a result, the holes on both sides of the wall eventually lined up, opening the view from gallery to gallery.

A bunch of holes randomly popped into some of the walls.

And this was a three-month performance piece that turned the wall into a kind of increasingly unstable element.

And the acoustic isolation was also destroyed.

Visual separation too.

Also there was constant moaning in the background which was very annoying.

And this is one of those blackout spaces with completely useless video work.

So rather than ensuring a neutral backdrop to the work on display, the walls began to actively compete for attention.

And this acoustic and visual annoyance basically exposed the work's displeasure with the comprehensive nature of the retrospective.

It was really cool when I started breaking down all the curated text.

I'm working on a project that was completed about a year ago.

It is the ICA, or Institute of Contemporary Art, on the Boston waterfront.

I don't have enough time to really show you this building, but I'll just say that it reconciles the exterior-focused nature of the property -- you know, this is a really great waterfront location in Boston -- and this other contradictory desire to have an interior-focused museum.

So the nature of the building is to see. So that's the main purpose of both its program and its architectural vanity.

The building incorporates the grounds, but distributes the grounds in very small portions the way the museum is planned.

So when you enter, you're basically squeezed by the theater, by the belly of the theater, into this very compressed space where the scenery is turned off.

Then step into this glass elevator right near the Curtain Wall.

This elevator is roughly the size of a studio apartment in New York City.

And while this is an upward view, walking into the theater can actually deny that view or open it up into the background.

And many musicians choose to use the theater's glass walls completely open.

Visibility is denied in the galleries with only natural light and re-exposed in the panoramic north gallery.

The original intention for this space, which unfortunately never materialized, was to use lenticular glass that only allowed some sort of vertical view.

In this very narrow space that connects the east and west galleries, I didn't aim for a climax, but rather a view that opens up as you walk from one end to the other.

It was closed because it was too scenic, and the mayor said, "No, I just want it to be open."

The architect lost here.

But at the top, and this is where my little talk comes from, is this mediatheque. It is suspended from a cantilevered section of a building.

So this is an 80 foot cantilever, which is pretty big.

So it's already protruding into space enough that from there this is this little area called the Mediatheque.

Mediatheque has about 16 stations where the public can access the server to view digital artworks and art curated from the web.

This is really a kind of very important part of this building, where the architecture - this is kind of technology free - the architecture is just a framing device, just editing the view of the harbor, the industrial harbor through the walls, the floor, the ceiling, exposing only the water itself, the texture of the water, like the hypnotic effect produced by electronic snow, lava lamps and so on.

And this is where we realized that the project is a perfect blend of technology and nature.

But there is no information there. It's just hypnosis.

Head to Lincoln Center.

They were the first to do this project 50 years ago.

We are still taking over, and we are doing a wide range of construction from small-scale repairs to large-scale renovations and large-scale expansion of facilities.

But we do it with significantly less testosterone.

This is a scope of work to be completed by 2010.

And for the purposes of this talk, I wanted to pick out just a few of the projects that briefly touched on this subject of architectural special effects. It just so happens that that's our current obsession, a little bit about eliminating or adding distractions.

It's Alice Tully Hall, tucked away under the Juilliard Building, a few floors down the street.

So, this is the entrance to Tally Hall before the renovation.

And we asked ourselves, why can't we be flashier than the other buildings at the Metropolitan Museum of Art and Lincoln Center?

And one of the things we were asked to do was give it a street identity, extend the lobby and make it visually accessible.

And we stripped down this naturally sealed building.

We basically did striptease, architectural striptease. There it is framed with this kind of canopy. It is the underside of the three-level extension of the Juilliard Theater, which is approximately 45,000 square feet. Cut it to a Broadway angle to expose it and use that canopy to frame the tally hall.

before and after shooting. (Applause.) Hold on, that's exactly what it is, there's still a long way to go.

But what I wanted to do was take a few seconds left to talk only about the hall itself, which is where we actually do the bulk of the work.

Therefore, the hall is a multi-purpose hall.

A client asked us to produce a wonderful chamber music hall.

Now, doing this in a 1,100-seat hall is really tough.

The concepts of chamber music and chamber music are related to salons and small performances. They asked us to bring intimacy.

How can we bring intimacy to the venue?

Intimacy means many things to us.

It means acoustic intimacy, it means visual intimacy.

One is the subway rumbling down the hall.

Another thing that can be modified is the shape of the holes.

It's like a coffin, basically sending all sound down the aisle like a gutter ball effect.

The walls are made of an absorptive surface, half absorptive and half reflective, not very suitable for concert acoustics.

This is Avery Fisher Hall, but the concept of junk—visual junk—has been very, very important to us in getting rid of visual noise.

The architecture is limited to 18 inches because one seat cannot be removed.

It's a very thin architecture.

First, it does a sort of partial box-to-box isolation to get rid of the distracting subway noise.

The whole hall is then wrapped in wood, which basically covers all surfaces: walls, ceiling, floor, stage, stairs, everything, boxes, almost like this Olivetti keyboard.

But it's acoustically designed to focus the sound in the house and on the stage. And here are the sound racks.

looking up at the hall. just part of the stage.

Everything you can imagine is just lined and built into this high performance skin.

But one more feature has been added.

So now that the hall has been stripped of all visual distractions and anything that interferes with this intimacy that is supposed to unite the house, audience and performers, we add small details, architectural extras, special effects and lighting.

We strongly believe that concert hall theater exists not only at the beginning of a concert, but also in the space during intermission and arrival.

So what we wanted to do was create this effect, this lighting effect, and we had to bioengineer the wooden walls for that.

And that requires the use of resin, a very thick resin with veneers of the same kind of wood used throughout the hall, to achieve a kind of seamless continuity that wraps the hall in light like a band of light. It connects audience and performer instead of separating them, just as the proscenium separates audience and performer.

Here's a mockup in Salt Lake City to give you an idea of ​​what this would look like in full size.

This is a guy from Salt Lake City. This is what they look like.

(Laughter.) And for us, this is really strange, the moment when the noise in the hall subsides a little while the audience is waiting for the performance to begin, it's very much like the curtains breaking or the chandelier going up, the walls giving off this glow, temporarily taking the attention away from the stage.

And here is the tally under construction.

I don't have much to say except that it's been a few minutes.

thank you very much.

(applause)

Today I bring you something beautiful.

This is the feather of one of Kenya's most beautiful birds, the Great Crested Guineafowl.

But this feather doesn't stop there.

If you've taken the time to observe the feathers around you while you're outdoors, you'll notice that they come in a wide variety of sizes, shapes, and even colors.

Feathers are one of the most amazing technologies nature has invented, and for centuries they have helped birds stay dry, warm and even fly powerfully.

Only some of the Tree of Life can actually make wings.

Of all the animals in the world, only birds are capable of creating something like the one I have today.

I personally have a nickname for them and prefer to call them Feathers.

That's the big difference between a bird and any other animal on earth, and if you can't make wings, you're not a bird.

(Laughter) Birds are a symbol of freedom for us humans, who are bound by the earth.

Thanks to these feathers, birds were able to overcome gravity and take to the skies in amazing ways.

Do you ever wish you could fly like a bird?

Birds are my passion and I want to change the way people think about birds.

The simplest reason I love them so much is because they are beautiful.

There are 10,000 species of creatures in the world, each with its own unique beauty.

Birds are wonderful. This lecture is dedicated to all birds in the world.

(Laughter) (Applause) Indeed, these birds have been a part of our lives and cultures all over the world for centuries, and every society has stories about them.

You've probably heard childhood stories about different birds and how they relate to humans.

I recently learned that our ancestors chased packs of vultures, helped locate carcasses dropped by large predators, and scavenge for some of their meat.

Birds are used as brands and labels all over the world.

Do you know the bald eagle?

It was chosen for the national emblem of the United States because of its majestic strength, beautiful appearance, and even longevity.

And just like us humans, who have managed to survive in nearly every habitat on earth, birds have conquered the world.

From beautiful penguin-like birds that live in cold ice sheets to lark-like birds that live in the hottest desert imaginable.

Indeed, these species have conquered this world.

Birds build homes just like we do.

A true pro in home building is a group of birds that we call the weaver. This name comes from the way they weave their nests.

Interestingly, birds love and date just like us humans.

In fact, you might be surprised to learn that men dress to impress women. We'll show you how.

Well, here we have Enaga Victory, but this is what it usually looks like.

But when it comes to breeding season, everything changes and this is how he looks.

(audience mutters) Right?

Birds, in multiple species, also love to be touched and hugged just like humans.

And I know you're wondering about this.

Yes, they kiss too, sometimes very deeply.

(Applause.) Some have learned to cheat on their spouses.

(Laughter) For example, African juniper. Females mate with multiple males, then fly off in search of other males to mate with, leaving the males behind to care for the chicks.

(Laughter) (Applause) And birds have helped us a lot and play a very important role in our ecosystem every day.

Vultures cleanse the environment by literally digesting disease-causing pathogens, disposing of carcasses that would be costly to clear from the environment.

A sizable flock of vultures can knock a carcass the size of a zebra straight to the bone in just about 30 minutes.

Owls help rid the environment of rodents. This saves money and keeps crops intact. And second, you don't have to buy harmful chemicals to treat rodents.

The beautiful sunbirds found in our environment are part of the natural pollination staff and help plants set fruit.

Together with other pollinators such as insects, they have actually helped us obtain most of the food crops we have long relied on.

Unfortunately, Bird's Tale is still far from perfect.

Wherever they live, they face many challenges every day.

The top threats facing birds are habitat loss and food availability.

Birds are also hunted, especially migratory birds and ducks that congregate in water bodies.

Especially in places like rice cropping schemes, poisoning has occurred in swarms that prefer to stick together.

In addition, power lines electrocute birds and wind farms slash birds as they pass through the blades.

Climate change is making a lot of headlines these days, but it's also affecting birds. Unfortunately, the places where birds used to live are no longer habitable, forcing them to move to better breeding and feeding grounds.

My own perspective on birds changed when I was still in high school. A boy beats a bird called an ogre hawk, injuring its wing and leg.

I was just 14 years old, standing there, this bird couldn't help itself, so I imagined a human being in a similar situation.

So, although I was hardly a biologist by then, I got together with three friends and decided to keep the birds until they regained strength and then release them.

Interestingly, the termites accepted beef from our school kitchen and we hunted termites on the property for dinner every day.

After a few days the strength returned and I released it.

We were so happy to see them flapping their wings and taking off gracefully.

And that experience changed our perspective on birds.

We actually created a magazine and called it "Hawk Magazine". This was in honor of the bird we helped in high school.

These high school experiences made me the conservationist I am today.

And a passion for birds should be especially important for Africa and all Africans. Because Africa is home to some of the most spectacular bird species found anywhere in the world, among other continents.

Imagine a name like "shoebill".

That's the name of the bird.

And countries like the Democratic Republic of the Congo, Tanzania, Uganda and Kenya lead the continent in species diversity.

These birds continue to provide the continent with critically important ecosystem services that Africa needs.

In addition, Africa has great potential to lead the world in avian tourism.

The economy will definitely benefit.

Imagine how many communities would benefit from a group of tourists visiting their village just to see the native birds found only in that village.

How can we help birds together?

Now is your chance to turn your passion for birds into a contribution to their survival. Becoming a citizen scientist allows you to do just that.

Citizen science is a growing trend around the world, creating scenarios where people share information with other members of the community about traffic updates, security alerts, and more.

That was exactly our perception as birdwatchers. Because birds are everywhere, and if you, or anyone in Africa, could tell us where they live, where they go to school, or where they work for the birds they find, we could create a map of all the species, and from there scientists could actually prioritize conservation efforts to the most important habitats.

Take these two projects for example. The African Raptor Databank, which maps all raptors on the African continent, and the Kenya Bird Map, which maps about 1,100 species that live in my country, Kenya.

These two projects now have an online database where people can submit data, which has been transformed into a highly interactive website that the public can use to make decisions.

However, when I started, there was a big problem.

I've had a lot of complaints from birders, and they'll say, 'I'm in a village, so I don't have access to a computer.

How can I tell which birds live in my house, school, or work? ”

This has forced us to revamp our strategy and come up with sustainable solutions.

It was easy. Mobile phones are becoming more and more popular in Africa, and we quickly learned that most regions have access to mobile phones.

That's why we have devised a mobile phone application for iPhone and Android smartphones and made it free for all birdwatching enthusiasts.

So we came up with the BirdLasser used in the Kenya Bird Map. There are also African Raptor Observations currently used in the African Raptor Data Bank.

This is a major advance in our research and has enabled us to obtain a vast amount of data from all bird watchers in the area.

This made me realize that citizen science is indeed very powerful. The reason is that citizen science is adaptive.

And I was able to actually convert many birdwatchers and start sharing new information.

When we started, we didn't realize that birds could be such a great gateway to other forms of animal conservation.

Interestingly, the Virtual Museum of Africa now has maps of dragonflies and damselflies, butterflies and moths, reptiles, frogs, orchids, spiders, scorpions, and even mushrooms.

Who could have imagined mushroom mapping?

This showed that we have indeed built a community of people who value Africa's nature.

I hereby invite all of you to join me in promoting the value of birds within your community.

Please tell your friends about birds. Because we always tend to love and care for the birds we know.

When you're at work, school, or at home, spend a few minutes of your free time at least looking around and seeing what beautiful birds there are.

Engage in citizen science with us and let us know what birds you spot in the places you visit.

Even easier, you can buy your child or sibling a pair of binoculars or a bird book to help them appreciate how beautiful these birds are.

Because one day they may want to take care of someone they know and love.

Children are truly our future.

Teach them to love feather craftsmen, for their love of birds can be a great gateway to understanding all that nature has to offer.

thank you very much.

(Applause.) Thank you.

I am the product of a bold decision of a leader.

After Tunisia's independence in 1956, its first president, Habib Bourguiba, decided to invest 20 percent of the national budget in education.

Yes, 20%. Even by today's standards, it's top notch.

Some protested.

What about infrastructure?

What about electricity, roads and water?

Aren't these things important?

I would argue that the most important infrastructure we have is the mind, the educated mind.

President Bourguiba helped establish free and quality education for every boy and every girl.

And, along with millions of other Tunisians, I am deeply grateful for that historic decision.

That's what brought me here today. Because today we are facing a global learning crisis.

I call this the learning crisis, not the education crisis. Because in addition to the 550 million children who are currently out of school, there are another 330 million children who are in school but failing to learn.

And if we do nothing, 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 children and young people, will not be in school or learning.

So two years ago I joined the Board of Education.

This is a committee assembled by former British Prime Minister and United Nations Special Envoy for Global Education Gordon Brown.

Our first challenge was to find out how big the learning crisis is.

How far does the problem really go?

Today we know that by 2030 half of the world's children will be unable to learn.

In this way, we have indeed discovered that the focus of the world needs to shift from schooling to learning. It goes from simply counting how many people are in the classroom to counting how many are actually learning.

And the second big challenge was, can we do something about this?

Is there anything we can do about this big, vast, quiet, and perhaps most neglected global crisis?

And what we discovered is that it can be done.

It's really amazing.

For the first time, we can get every child in school and learning within just one generation.

And you don't even really need to invent the wheel for that.

We only need to learn from the best student in our class, but we don't have to learn from the best student in our class, the best student in our own class.

What we actually did is look at countries by income level: low, middle, and high income.

We looked at what the 25 percent of countries that improved fastest in education were doing. They found that if all countries progressed at the same rate as the fastest rising countries within their income levels, they could have all their children in school and learning within just one generation.

Let's take an example.

Take Tunisia, for example.

We are not saying that Tunisia should act as fast as Finland.

Don't be rude, Finland.

We are telling Tunisia, "Look at Vietnam."

We spend about the same amount on primary and secondary students as a percentage of GDP per capita, but today we are achieving higher outcomes.

Vietnam has introduced standardized assessments of reading, writing and mathematics, Vietnamese teachers are better monitored than in other developing countries, and student performance is made public.

And it shows in the results.

In the 2015 PISA (International Student Assessment Program), Vietnam outperformed many wealthy economies, including the United States.

Now, if you're not an education expert, you might be asking, "What's new and what's different?"

Isn't every country tracking the progress of their students and publishing their achievements? ”

no. The sad answer is no.

we are far from it.

Only half of developing countries have systematic learning assessment in primary school, and even less in secondary school.

So how should teachers focus their attention on delivering results if they don't know if children are learning? And if we don't know if our children are learning, how should countries prioritize their education spending against real results?

That is why the first big change before investing is to bring results to the education system.

Because pouring more money into a broken system can only lead to more inefficiencies.

And what I'm really worried about is that if children go to school and don't learn, education will be devalued, spending on education will be devalued, and governments and political parties will say, 'Oh, we spend a lot of money on education and our children aren't learning.

they don't have the right skills.

You probably need to cut back on your spending. ”

Improving the current education system to achieve results is important, but it is not enough.

What happens in countries where there is a shortage of qualified teachers?

Take Somalia for example.

If every student in Somalia became a teacher, that is, if every person who completed tertiary education became a teacher, there would be a shortage of teachers.

And what about children in refugee camps and very remote rural areas?

Take Philippe, for example.

Filipe lives in one of thousands of communities along the Amazonas River.

There are 20 families in his village of 78 people.

In 2015, Filipe and his classmate were the only two to attend Grade 11.

Amazonas is a state in northwestern Brazil.

It is 4.5 times the size of Germany and is completely covered with jungle and rivers.

Ten years ago, Filipe and his students would have had only two options. Either move to the capital, Manaus, or stop studying altogether. Most students did.

However, in 2009 Brazil passed a new law guaranteeing secondary education for all Brazilians and obliging all states to implement secondary education by 2016.

But as we all know, providing access to quality education in Amazonas is costly and expensive.

How do you plan to attract math, science, and history teachers across the community?

And even if they do find it, many people will not want to move there.

Faced with this impossible challenge, civil servants and state employees have developed remarkable creativity and entrepreneurial spirit.

They developed a media center solution.

It works like this.

Manaus has professionally trained content teachers who deliver lessons via livestream to over 1,000 classrooms in distributed communities.

These classrooms have between 5 and 25 students and more conventional tutors support their learning and development.

Manaus' 60 content teachers work with over 2,200 tutors in these communities to customize lesson plans to suit the situation and time.

So why is this distinction between content teachers and tutoring teachers important?

First of all, as I said earlier, many countries have a shortage of qualified teachers.

But secondly, because teachers do too many things they are not trained to do or should not do.

Take Chile for example.

In Chile, each doctor has four and a half staff, and four and a half staff to support them. Chile ranks lower among developing countries, with an average of 10 staff members supporting each doctor.

However, Chilean teachers are supported by 0.3 people, which is less than half of that.

Imagine a ward with 20, 40, 70 patients. One doctor does all the work, no nurses, no medical assistants, no other people.

You'd say that's silly and impossible, but this is what teachers around the world do every day in classrooms of 20, 40, or 70 students.

This separation of content and tutor teacher is amazing. Because the paradigm of teachers has changed, each doing what they do best and children learning not just in school, but in school and learning.

And some of these content teachers have become famous teachers.

Some of them even run for election. They have contributed to elevating the status of the profession so that more students want to become teachers.

And what I love about this example is more than changing the teaching paradigm.

It teaches us how to use technology for learning.

Live streaming is two-way so Filipe and other students can present information.

And we know technology isn't always perfect.

As you know, state officials expect 5 to 15 percent of classrooms to be out of live streams each day due to flooding, antenna failures, or Internet malfunctions.

Still, Filipe is one of over 300,000 students who benefited from the media center solution and were able to attend primary school.

It's a living example of how technology can become more central to learning than just an add-on, helping to provide school for children when they can't go to school.

Okay, I hear you.

You say, "How do we implement this in the world?"

Having been in government myself, I have seen how difficult it is to implement the best ideas.

So, as a committee, we have launched two initiatives to make the Learning Generation a reality.

The first is called the “Pioneering Nation Concept.”

More than 20 countries in Africa and Asia have made education a top priority and are committed to transforming their education systems for results.

We have trained national leaders in a methodology called the Delivery Approach.

There are basically two things this does.

During the planning phase, we bring teachers, teachers' unions, parents' associations, government officials, NGOs, all in one room to ensure that the reforms and solutions we come up with are shared and supported by all.

And in the second phase, we do something special.

A ruthless type that focuses on follow-up.

So every week we check to see if it was done or what was supposed to be done, and sometimes we actually send people to the districts and schools to check instead of just hoping it will happen.

To many it may sound like common sense, but it's not common practice and that's actually why so many reforms fail.

The exam was piloted in Tanzania, where the pass rate of secondary school students increased by 50% in just over two years.

Now, the next initiative to realize the learning generation is fundraising. who pays for this?

Therefore, we believe and insist that domestic financing should be the cornerstone of education investment.

Remember when I talked about Vietnam beating the US in PISA earlier?

This is not only due to improvements in the education system, but also due to Vietnam increasing investment from 7% to 20% of the national budget in 20 years.

But what if countries want to borrow money for education?

If you want to borrow money to build bridges and roads, it's very easy and simple, but not for education.

It's easier than an educated person to make a shiny picture of a bridge and show it to everyone.

It's kind of a long term commitment.

So we came up with a solution to get out of the middle-income trap. Countries that are not poor enough, but thankfully no longer profitable from subsidies or interest-free loans, are not wealthy enough to charge attractive interest rates on loans.

So we pool donations to education financial institutions to provide more funding for education.

We will subsidize or abolish interest payments on loans so that reforming countries can borrow money to reform their education systems and pay this money over time while enjoying the benefits of a well-educated population.

This solution was recognized at the last G20 meeting in Germany, and today education is finally on the international agenda.

But let's bring this back to the individual level. Because this is where the impact is.

Without that decision to invest 20 percent of the budget of a young country, or 20 percent of the budget of a young country, in education, I would not have been able to attend school, let alone hold a ministerial position in the government that successfully completed the transition phase in 2014.

As the only democracy to emerge from the Arab Spring, Tunisia was awarded the Nobel Peace Prize in 2015 as a continuation of its bold leader's determination.

Education is a civil rights struggle, a human rights struggle for our generation.

Quality education for all. That's the freedom fight we must win.

thank you.

(applause)

So when people express their fear of artificial intelligence, very often they think of a runaway humanoid robot.

Look? Terminator?

It may be something to consider, but it's a distant threat.

Or worry about digital surveillance using tropes of the past.

George Orwell's 1984 is back on the bestseller list.

Great book, but not the correct 21st century dystopia.

What we should fear most is not what artificial intelligence will do to us by itself, but how those in power will use it to control us and manipulate us in novel, sometimes hidden, subtle and unexpected ways.

In the near future, much of the technology that threatens our freedom and dignity is being developed by companies such as Facebook, Google, Amazon, Alibaba, Tencent, etc., who are in the business of collecting and selling our data and attention to advertisers and others.

Artificial intelligence is now starting to power businesses as well.

And artificial intelligence may seem like the next thing after online advertising.

it's not.

Category jump.

It's a whole different world and it has a lot of potential.

It has the potential to accelerate our understanding of many research areas.

But, in the words of a famous Hollywood philosopher, “with tremendous potential comes tremendous risk.”

Now let's look at a fundamental fact of our digital lives: online advertising.

right? We kind of dismiss them.

They look crude and inefficient.

We've all experienced ads following us around the web based on what we've searched and read.

As you know, search for a boot and it will follow you wherever you go for a week.

Even after you give in and buy them, they still keep chasing you.

We've grown accustomed to such basic, cheesy operations.

We roll our eyes and think, "Look, this is not going to work."

But digital technology is more than just advertising online.

Now, to understand it, let's consider an example from the physical world.

Did you know that supermarkets have candy and gum at eye level near the cash register?

This is designed to make parents whine just as they are about to check out.

This is the persuasion architecture.

It's not good, but it works to an extent.

So you can find it in any supermarket.

Now, in the physical world, there is a limit to what can be placed near the cash register, so persuasion architectures like this are somewhat limited. right?

And candy and gum, it's the same for everyone, even though it mostly only works for people with a little whining human beside them.

In the physical world, we live within these limits.

But in the digital world, persuasion architectures can be built in billions, knowing their weaknesses can target individuals one by one, infer, understand, and deploy. Also, the persuasion architecture can be sent to everyone's phone's private screen, so it's invisible to us.

And it's not.

And that's just one of the basic things artificial intelligence can do.

Let's take an example.

Suppose you want to sell flights to Las Vegas. right?

So, in the previous world, you could think of a few demographics to target based on experience and speculation.

For example, you might try advertising to men between the ages of 25 and 35, people with high credit card limits, retired couples, and so on. right?

I would have done so in the old days.

With big data and machine learning, it doesn't work anymore.

To imagine it, think of all the data Facebook holds about you. Every status update you've ever entered, every Messenger conversation you've had, every place you've logged in, and every photo you've uploaded there.

Even if you start typing something and then change your mind and delete it, Facebook will save and analyze them.

Increasingly, it tries to match users with offline data.

We also purchase large amounts of data from data brokers.

It can include anything from financial records to large chunks of your browsing history.

right? In the United States, such data is routinely collected, collated, and sold.

In Europe there are stricter rules.

What happens there is that these machine learning algorithms churn over all the data, which is why they are called learning algorithms. Learn to understand the characteristics of people who have previously purchased tickets to Las Vegas.

As we learn this from existing data, we also learn how to apply this to new people.

So if you are introduced to a new person, you can classify if that person is more likely to buy a ticket to Las Vegas.

are you OK. You are considering an offer to buy a ticket to Las Vegas.

You can ignore it.

But that's not the point.

The problem is that we no longer really understand how these complex algorithms work.

I don't understand how they do this categorization.

It's a huge matrix, thousands of rows and columns, maybe millions of rows and columns, and even if it had all the data, no programmer or anyone looking at it would be able to understand exactly how it works any more than if you were shown a cross-section of my brain you wouldn't know what I was thinking right now.

We're no longer programming, it's like growing an intellect that we don't really understand.

And because these things only work with huge amounts of data, we also encourage close scrutiny on all of us so machine learning algorithms can work.

That's why Facebook wants to collect all kinds of data about you.

Algorithms work better.

Now let's expand the Las Vegas example a bit.

What if a system we don't understand recognizes that it's easy to sell Las Vegas tickets to people with bipolar disorder who are entering a manic state?

Such people tend to be spendthrifts and compulsive gamblers.

They can do this, but you wouldn't have a clue what it was they were aware of.

Once I explained this example to a bunch of computer scientists, and then one of them came up to me.

I was worried and said, "That's why I couldn't publish it."

I thought, "What can't be published?"

He tried to see if he could actually catch the onset of mania from social media posts before clinical symptoms appeared, and it worked, very well, but he had no idea how it worked or what was causing the symptoms.

Well, if he doesn't publish it the problem won't go away. Because there are already companies developing this kind of technology, and a lot of it will be commercially available soon.

This is not so difficult anymore.

Have you ever gone on YouTube with the intention of watching one video and an hour later you've watched 27?

Did you know that YouTube has a "next" column on the right side that autoplays something?

It's an algorithm that selects what you think the user might be interested in and might not find on their own.

Not a human editor.

That's what algorithms do.

It just picks up what you've watched or watched by people just like you, guesses it must be something you're interested in, wants to see more of, and displays more.

Unless otherwise, this seems like a harmless and useful feature.

So in 2016, I attended a rally of then-candidate Donald Trump to study the movement that supported him as an academic.

I study social movements, so I was studying that as well.

Then I wanted to write something about his rally, so I watched it several times on YouTube.

YouTube started autoplaying videos of white supremacy, in order of extremism.

Watching one offered an even more extreme one, which also autoplayed.

Watch Hillary Clinton or Bernie Sanders content and YouTube will recommend conspiracy theories and autoplay, and it goes downhill from there.

Now, you might think this is politics, but it's not.

This is not about politics.

This is exactly the algorithm that understands human behavior.

I had seen a video about vegetarianism on YouTube before, and YouTube recommended and autoplayed a video about being vegan.

I feel like it's not hardcore enough for YouTube.

(Laughter.) So what's going on?

Well, YouTube's algorithm is proprietary, but here's what I think.

The algorithm found that if people could be enticed to see something more hardcore, they were more likely to stay on the site and watch video after video while Google was serving ads.

Now that no one cares about the ethics of the store, these sites allow you to create profiles of people who hate Jews, think Jews are parasites, and have blatantly anti-Semitic content and target them with ads.

Algorithms can also be leveraged to find similar audiences—people whose profiles do not contain such blatant anti-Semitic content but which the algorithm detects may be susceptible to such messages—and target them with ads.

Now, this may sound like an unbelievable example, but it's a reality.

ProPublica researched this and found that Facebook can actually do this, and Facebook provided useful suggestions on how to expand its audience.

BuzzFeed tried it for Google, and soon found that Google could do it too.

And it wasn't expensive either.

ProPublica reporters spent about $30 to target this category.

So last year, Donald Trump's social media manager revealed that he was using Facebook's dark posts to demobilize people, not to convince them, but to convince them not to vote at all.

And for that they specifically targeted African-American men in major cities like Philadelphia, for example, and I'll read exactly what he said.

I am quoting.

They use "private posts whose views are controlled by campaigns so that only those who want to see them can see them.

I modeled this.

That would dramatically affect her ability to get these people out. ”

What's in those dark posts?

we don't know.

Facebook won't tell you.

So Facebook also algorithmically places posts your friends have posted on Facebook and pages you follow.

Not everything is shown in chronological order.

This will order them in a way that the algorithm decides to keep users on the site longer.

Well, this has many consequences.

You may be wondering if someone on Facebook is snubbing you.

Algorithms may prevent us from seeing your post.

The algorithm prioritizes some of them and ignores others.

Experiments show that what algorithms choose can affect your emotions.

But that's not all.

It also influences political behavior.

So in the 2010 midterm elections, Facebook conducted an experiment with 61 million people in the US, and it came out after the fact.

So some people saw a simple "Today is Election Day", and some people saw a slightly tweaked little thumbnail of a friend who clicked "I voted".

This simple tweak.

OK? So the photo was the only change, and the survey, which was confirmed by the voter rolls, found that the post that was posted just once added an additional 340,000 voters to the election.

Fluke? no.

Because we repeated the same experiment in 2012.

And then, with a one-time-only civic message, another 270,000 voters gathered.

For reference, the 2016 US presidential election was decided by about 100,000 votes.

Now Facebook also makes it very easy to guess what your politics are, even if you don't reveal them on the site.

right? These algorithms can do that very easily.

What if a platform with such authority decided to make one candidate's supporters more supportive than another?

How on earth can we know that?

Well, we started out in a seemingly harmless place, with an online adder following us, but ended up in another place.

As citizens, and as citizens, we no longer know if we are seeing the same information or if we are seeing the information that someone else is seeing. Without a common information base, public debate is slowly becoming impossible, and we are only in the early stages.

These algorithms can very easily infer people's ethnicity, religious and political views, personality traits, intelligence, happiness, addictive substance use, parental separation, age, gender, etc. just from their Facebook likes.

These algorithms can identify protesters even if their faces are partially obscured.

These algorithms may be able to detect people's sexual orientation just from their dating profile pictures.

These are probabilistic guesses, so they may not be 100% correct, but I doubt that a few false positives will stop the powerful from using these technologies. Of course, that raises a whole other layer of problems.

Imagine what nations can do with vast amounts of data about their citizens.

China is already using facial detection technology to identify and arrest people.

And here is the tragedy. We are building a surveillance authoritarian infrastructure just to get people to click on our ads.

And this would not be Orwellian authoritarianism.

This is not "1984".

Now, if authoritarianism were to use overt fear to terrorize us, we would all be terrified. But we know it, we hate it, we will resist it.

But if those in power are using these algorithms to quietly monitor us, judge us, nag us, anticipate and identify troublemakers and rebels, deploy persuasion architectures at scale, and manipulate individuals one at a time by exploiting individual weaknesses and vulnerabilities; and we may not even know we are there. I am also in it.

That means Facebook's market capitalization is approaching $5 trillion.

Because it works very well as a persuasion architecture.

But its architectural structure is the same whether it sells shoes or politics.

Algorithms don't know the difference.

The same algorithms that have been unleashed upon us to make us more receptive to advertising organize our political, personal and social information flows, and they must change.

Don't get me wrong. We use digital platforms because they provide great value.

I use Facebook to keep in touch with friends and family around the world.

I wrote about how important social media is to social movements.

I have been researching how these technologies can be used to bypass censorship around the world.

But it's not like the people who run Facebook and Google are maliciously and deliberately trying to further polarize the country and the world and encourage extremism.

I have read many well-intentioned statements made by these people.

But it's not the intentions or statements of people in the tech industry that matter, it's the structures and business models they're building.

And that is the heart of the matter.

Facebook is a $5 trillion dollar scammer whose site doesn't serve ads, doesn't work as a persuasion architecture, or is a big concern because of its influence.

One or the other.

The same is true for Google.

So what can we do?

This has to change.

I can't give you a quick recipe, as it requires restructuring the entire way digital technology operates.

It includes everything from how the technology is developed to how financial and other incentives are built into the system.

We must face and try to deal with the lack of transparency created by proprietary algorithms, the structural challenges of machine learning opacity, and all this indiscriminate data being collected about us.

We have a big task ahead of us.

We need to mobilize technology, creativity, and politics to build artificial intelligence that can help us achieve human goals, but also constrained by human values.

And I also understand that this is not easy.

You may not easily agree on what these terms mean.

But if we take seriously how these systems on which we rely so much operate, I don't see how this discussion can be put off any further.

These structures organize how we function and control what we can and cannot do.

And many of these ad-supported platforms boast of being free.

In this context, it means that we are the product being sold.

We need a digital economy where our data and our attention are not sold to top-bid authoritarians and demagogues.

(Applause.) Going back to paraphrasing Hollywood, we want the incredible potential of artificial intelligence and digital technology to blossom, but to do that we must open our eyes and face this incredible threat now.

thank you.

(applause)

What if an African girl from a traditional family in some part of future Africa could get into the best university in a galaxy off-planet?

What if she decides to go?

This is an excerpt from my novel "Binti" trilogy. I turned on the transporter and prayed silently.

I didn't know what to do if it didn't work.

My transporter was cheap and would short out with a drop of water or even a grain of sand.

It was flawed and most of the time I had to reboot many times until it worked.

"Stop now, stop now," I thought.

The transporter shook on the sand and I held my breath.

Small, flat and black like a prayer stone, it floated slowly out of the sand with a quiet hum.

Finally, it also created the power to lift the load.

I grinned.

This allowed me to catch the shuttle on time.

I wiped my forehead with my index finger, knelt down and rubbed my finger into the sand, rubbing the sweet-smelling red clay into it.

"Thank you," I whispered.

It was a half mile walk down a dark desert road.

If the carrier is working, it will arrive on time.

I sat up straight and closed my eyes.

The weight of my entire life now rests on my shoulders.

For the first time in my life, I was rebelling against the most traditional part of myself.

I was leaving in the middle of the night and they had no idea.

I have nine siblings, all older than me except for my younger sister and younger brother, and I never imagined this would happen.

My parents never imagined I would do that in a million years.

By the time they all realized what I had done and where I was going, I would have left Earth.

While I was away, my parents were yelling at each other that I should never set foot in their house again.

The four aunts and two uncles who lived across the street were shouting and gossiping among themselves about how I had scandalized the whole lineage.

I was going to be an outcast.

"Go," I whispered softly to the carrier, stamping my feet.

The thin metal rings around my ankles rattled loudly, but I stamped again.

Once I used the transporter, it worked best when I didn't touch it.

"Let's go," I said again, with sweat on my forehead.

When nothing moved, I happened to push two large suitcases on top of the force field.

They moved smoothly and I breathed a sigh of relief again.

At least luck was on our side.

So, in some part of Africa in the distant future, Binti is a Himba math genius.

She got accepted to a university on another planet and decided to go there.

Carrying the blood of his brethren in his veins, and clothed in teachings, paths, and even land, Binti leaves Earth.

As the story progresses, she becomes more than just another.

This idea that leaving brings, and more, is one of the hearts of Afrofuturism, which could simply be called another type of sci-fi.

The difference between classic sci-fi and Afrofuturism is best illustrated using the octopus analogy.

Like humans, octopuses are some of the most intelligent creatures on the planet.

However, octopus intelligence evolved from a different evolutionary lineage than humans, so the basis is different.

The same is true of the various forms of sci-fi foundations.

Much of science fiction speculates about technology, society, social issues, things outside the Earth, and things inside the Earth.

SF is one of the greatest and most effective forms of political writing.

It's all a question of "what if?"

Still, not all sci-fi have the same ancestral lineage, and that lineage is Western-rooted sci-fi, mostly white males.

Isaac Asimov, Jules Verne, H.G. Wells, George Orwell, Robert Heinlein.

So what if a Nigerian American wrote science fiction?

Growing up, I didn't read much science fiction.

I couldn't relate to these narratives, which were preoccupied with xenophobia, colonization, and seeing aliens as others.

And I didn't see anyone who looked like me in those stories.

In the novella trilogy "Binti", Binti leaves Earth to seek education from extraterrestrials.

She goes out as she is, as she is, with her own culture.

My impetus to write this story was not because I was following the classic space opera series, but because of the deep running blood, family, cultural conflicts, and the need to see an African girl leave Earth of her own accord.

My SF has different African ancestry.

So I'm a Nigerian American.

I was born to Nigerian immigrant parents and grew up in the United States, one of the cradles of classic science fiction.

But it was my Nigerian heritage that got me to write sci-fi.

Specifically, he cites a family trip to Nigeria in the late '90s.

I have been traveling to Nigeria with my family since I was little.

These early trips inspired me.

So the first story I wrote happened in Nigeria.

I write magic realism and fantasy primarily inspired by my love for Igbo and other West African traditional cosmology and spirituality.

But in the late 90's, I started to realize the role of technology in Nigeria. There was cable TV and cell phones in the village, a cybercafe occupied by 419 crooks, and a small generator hooked up to my cousin's desktop computer because the power was constantly on and off.

And my Americanness was so intriguing that these things most Nigerians consider normal.

My interest eventually spawned a story.

I started opening strange doors.

What would happen if aliens came to Lagos, Nigeria?

This is an excerpt from my novel "Lagoon".

Everyone in the world saw it.

It was a real introduction to the chaos going on here in Nigeria, West Africa and Lagos.

So many people in Lagos had portable, rechargeable, glowing, vibrating, chirping, tweeting, communicating, connected devices that virtually everything was recorded and posted online in some way, in some form, quickly.

The modern human world is connected like a spider's web.

The world was watching.

It watched in fascinated horror for information, but mainly for entertainment.

Footage documenting what was happening dominated every international news source, video-sharing website, social network, circle, pyramid and trapezium.

But the story goes deeper.

It's in the mud, in the dirt, in the earth, in the nostalgic memories of the dirty universe.

It lies in the ever-intermingling past, present and future.

it is in the water.

It is among the powerful spirits and ancestors who lived in Lagos.

It is in the hearts of the people of Lagos.

Change begets change.

Alien Ayodel knew that.

Her people all know it.

So this is the voice of Udide, the best spider artist. Older than dirt, he lives in the dirt beneath the city of Lagos, listening, commenting, and weaving tales of extraterrestrials coming to Lagos.

Eventually, a giant spider, the size of a house and responsible for weaving past, present, and future, decides to become part of the story.

Like spider artist Udide, the blood of African sci-fi runs deep, old but ready to come out. And when it does come out, imagine the new technologies, ideas, and sociopolitical changes it inspires.

For Africans, homegrown science fiction can be a will to power.

what if?

That's a powerful question.

thank you.

(applause)

Let me show you some images of tomorrow's cities that I have in mind.

That is Kibera, Nairobi's largest squatter community.

This is a squatter community located in Sanjay Gandhi National Park in Bombay, India, more recently called Mumbai.

This is Rio de Janeiro's largest and most urbanized favela, Hozinia.

And this is Sultanberg, one of Istanbul's largest squatter communities.

These are what I see as the cities of tomorrow, the new urban world.

Now why do I say that?

To tell you, I have to tell you about this guy here, his name is Julius.

And I met Julius the last week I lived in Kibera.

So, I've been there for almost 3 months and I was patrolling the city to go to different squatter areas and Julius also followed and he had bug eyes and at one point as we walked around he held my hand and asked for support, something most Kenyans never think about.

They are very polite and do not rush forward.

And I later found out that it was Julius' first day in Nairobi and he was one of them.

As a result, nearly 200,000 people migrate from rural areas to urban areas every day.

That's, in all fairness to the statisticians I spoke to this morning, it's not nearly 1.5 million people a week, it's almost 1.4 million people a week, but I'm exaggerating because I'm a journalist, so it's almost 1.5 million people a week, and almost 70 million people a year.

If you do the math, that's 130 people every minute.

So in the 18 minutes I've been given to speak here, 2-3,000 people will travel to the city.

And here are the statistics.

There are currently 1 billion squatters, or 1 in 6 people on the planet.

2030 -- Two billion squatters, one in four people on the planet.

And it is estimated that there will be 3 billion squatters by 2050, more than 1 in 3 people on the planet.

So these are the cities of the future and we need to be involved in them.

This morning I was thinking about the good life. Before I get to the rest of my presentation, I'm going to break a TED rule here. I will read part of my book as soon as possible.

Because I think it says something about reversing our perception of what the good life is.

"The hut was made of corrugated metal and was set on a concrete pad.

It was a 10x10 cell.

Armstrong O'Brian Jr. shared it with three other men.

Armstrong and his friends had no water, purchased from a nearby water owner, no toilets, families on the property shared a single pit toilet, and no sewers or sanitation.

They had electricity, but it was an illegal service tapped from someone else's wires and could only light one weak light bulb.

It was Southland, a small shack west of Nairobi, Kenya.

But with over half of Nairobi city living like this, it could have been anywhere in the city.

1.5 million people are crammed into mud and metal huts without services, toilets or rights.

"Mr Armstrong explained the grim reality of their situation. They are paying a relatively high rent of 1,500 shillings for a Kenyan slum, about $20 a month, and they cannot afford to be late with their payments.

"If you have a month's debt, the landlord will come with his henchmen and kick you out. He will confiscate your belongings," Mr. Armstrong said.

“Not a month, but a day,” interrupted his roommate Hilary Kivagendi Onsom, who was cooking ugali, a spongy white cornmeal concoction that is the staple of the country.

They called the landlord Wabenji. This means someone who has enough money to drive a Mercedes-Benz.

Hillary served ugali with meat and fried tomatoes. The sun beat down on the thin steel roof. And I was sweating while eating.

"After we finished, Armstrong adjusted his tie, put on his wool sports jacket, and we went out into the sunshine.

Outside, a pile of rubbish formed the boundary between Southland and the neighboring legal district of Langata.

It was probably 8 feet high, 40 feet long and 10 feet wide.

It was then installed in a wider watery exudate.

Two boys were climbing Mt Kenya of garbage when we passed by.

They shouldn't have been more than 5 or 6 years old yet.

They were barefoot, their toes sinking into the mud with every step, and hundreds of flies splattering from the stinking mountain.

I thought they were doing King of the Hill, but I was wrong.

When we got to the top of the mountain, one of the boys pulled down his pants, squatted down, and defecated.

Flies were scurrying around his legs, hungry.

If you have 20 families, or 100 or so people sharing one bathroom, it's probably not a big deal for a boy to poop in a garbage pile.

But that was a striking contrast to what Armstrong said during our meal about how he values ​​the quality of life in his neighborhood.

“For Armstrong, Southland was not constrained by material conditions.

Instead, the human spirit radiated from metal walls and trash heaps, offering something that no legitimate neighborhood could deliver: freedom.

"This place is so addicting," he said.

"It's a simple life, but no one limits you.

No one controls your actions.

Once you stay here you can never go back. ’ What he meant was to go back over that pile of garbage to a legal city, a legal building with legal leases and legal rights.

"Once you live here, you can live here forever," he said. So he has hope and this is where these communities start.

This is probably the most primitive shack you can find in Kibera, little more than a stick and mud hut next to a garbage heap.

Bombay, India is gearing up for the monsoon.

This is a home improvement. Put a plastic tarp on the roof.

This is Rio de Janeiro, it's getting a little better, right?

Fragments of excavated terracotta tiles and small signs are visible, plastered and colored over the bricks. This is Sly Montakaya's house in Sultanbury and it just keeps getting better.

he has a fence he knocked on the door. He is putting new tiles on the roof.

And when you get Rocinha, you know it's even better.

The buildings here are multi-storey.

they will develop. Far right is room, room, room and what appears to be stacked on top of room.

And what people do is develop a one-storey or two-storey house, sell the loggia or roof rights, and on top of that building another person builds, that person sells the roof rights, and someone else builds on top of that building.

All these buildings are made of reinforced concrete and bricks.

And in Sultanberg, Turkey, they are made to an even higher level of design.

The litter on the front is mattress filling, which can be found all over Turkey.

People dry and inflate mattress fillings on the roof.

However, the green building behind it turns out to be vacant on the top floor and is being built by people with a possible extension.

And built to a fairly high standard of design.

And in the end we will have squatter houses like this, built on the suburban model.

Hey, that's a detached house in a squatter community.

It is also in Istanbul, Turkey.

These are very important places, communities.

This is Estrada da Gavea, the main street of Rocinha, with a bus line running through it and a lot of people coming and going.

These urban communities are actually more important than illegal communities.

There's a lot more going on inside them.

This is a typical Rocinha lane called "Beko". This is how you move around the community.

It's on very steep ground.

These are built on hills inland from Rio's beaches, and you'll find that the houses simply cantilever over natural obstacles.

So it's just a rock on the hillside.

And these bekos are usually very crowded, with people banging furniture there, putting refrigerators and pushing all sorts of things.

All beer is carried on your shoulder.

Beer is very important in Brazil.

This is a Kenyan commerce, located on railroad tracks and so close to them that merchants sometimes have to pull their goods out of the way.

This is also a market in Kenya, the Toy Market, which has many dealers with almost anything you want to buy.

The green thing in front is mango.

This is Kibera's shopping street, and you'll find a soda store, a clinic, two hair salons, a bar, two grocery stores, and a church.

It's a typical downtown street. It just happened to be self-built.

Here on the right side is the so-called hotel. If you look at the fine print under the awning, it's a hotel.

And what a hotel means in Kenya or India is a place to eat.

So it's a restaurant.

People steal power - this is Rio.

People eavesdrop, and thieves called "grilos" or "crickets" break in, steal power, and put wires up in their neighborhoods.

People burn garbage or dig their own sewers to dispose of it.

Let's talk more about plastic bags than plankton.

In addition, there are cases where we naturally dispose of garbage.

And when they have more money, they cement the roads, install sewers, fine water pipes, and so on.

This is the water going to Rio. People run water pipes here and there, and there's a little hut up there with a pump, and that's what people do. they steal electricity. They install a pump, pull it into the water main, and pump the water up to the house.

The question, then, is how to get from the village of mud huts to the more developed city to the highly developed Sultanbury.

I would say there are two things.

One is that people need assurance that they will not be evicted.

It does not necessarily imply property rights. I disagree with Hernando de Soto on that question, as property rights raise many complex issues.

Most of the time they are sold to people who then go into debt and have to pay off that debt and sometimes have to sell their property to pay off the debt.

There are various other reasons why property rights do not work in such cases, but the security of ownership is necessary.

And they need access to politics for two reasons.

It can mean community organizing from below, but it can also mean potential from above.

I say so because the Turkish system is remarkable.

Turkey has two major laws that protect squatters.

First, it's called 'Gesekondu' in Turkish, which means 'built overnight', and in Turkey, if you build a house overnight, you can't evict it without due process unless you're caught by the police at night.

And the second aspect is that once 2,000 people join the community, they can petition the government to be recognized as a statutory semi-municipal government.

And when it comes to statutory quasi-municipalities, suddenly politics comes into play.

They are allowed to have an elected government, collect taxes and provide municipal services, and that is exactly what they do.

In short, they are the civic leaders of the future.

The woman in the center is Gita Ziwa.

She lives in one of the tents on the highway median in Mumbai.

It is Surekha Gundi. She lives with her family in a tent along the median on the same highway.

they are very frank. they are very active

They can be community leaders.

This woman is Nain, which means "grandmother" in Turkish.

And there are three old ladies living in the self-built house behind her, they've been there for 30 or 40 years, and they're the focal point of the community there.

This is Richard Mussama Peter, a street photographer touring Kibera.

He makes money taking pictures of his neighborhood and neighbors, making him a great resource for his community.

And finally, my choice to run for mayor of Rio is Ceginio. Cesinio is a fruit merchant with two children here and is much more honest, dedicated and caring. I do not know.

The future of these communities lies in their people and our ability to work with them.

So I think what I read from this book, what Armstrong said, and the message I got from all these people is that these are neighborhoods.

The problem is not urban poverty.

The problem is not bigger and more comprehensive.

The problem is recognizing that these are neighborhoods, that this is a legitimate form of urban development, and that cities must involve these residents. Because they are building the cities of the future.

thank you very much.

I was a student in the 60s, a time of social upheaval and question, and a sense of idealism awakening on a personal level.

The Vietnam War was raging, the civil rights movement was underway, and photography had a huge impact on me.

Our political and military leaders have told us one thing, and our photographers have told us another.

I believed the photographer, and so did millions of other Americans.

Their image fueled resistance to war and racism.

They not only recorded history, they helped change the course of history.

Their pictures became part of our collective consciousness, and as consciousness evolved into shared conscience, change became not only possible, but inevitable.

The human face is put on monumental issues that, when viewed from afar, have abstract, ideological or global implications.

What happens on the ground, far from the halls of power, continues to happen to ordinary citizens.

And I realized that documentary photography has the ability to interpret events from their perspective.

It gives a voice to those who otherwise could not have a voice.

My TED wish. We have an important story to tell, and we hope that TED will help us access it and come up with innovative and exciting ways to use news photography in the digital age.

thank you very much.

[ 10.3.08 -- The story is interrupted. ] [ "I am a witness and these photos are my testimony." ] [ South Africa ] [ This is happening now. ] [ Cambodia ] [ Swaziland ] [ One person dies every 20 seconds. ] [ Thailand ] [ An ancient disease takes on a deadly new form. ] [ Siberia ] [ Lesotho ] [ TB: The Next Pandemic? ] [ India ] [ TB is preventable and treatable ] [ But due to inadequate treatment, TB is mutating. ] [ XDR-TB: ] [ Extreme drug-resistant tuberculosis. ] [There is no sure cure. ] [ Patients often die within weeks of diagnosis. ] [ 49 countries have reported XDR-TB. ] [ XDR-TB is a serious threat to global health. ] [extreme epidemic, suffering, suffering] [extreme loss, pain, pandemic] [extremely preventable. ] [XDR-TB. ] [Let's stop now. ] [Spread the word. Please stop being sick. ] [Visit XDRTB.org now. ] [ XDRTB.org: We are the cure. ] [ We are the cure. ] [ Thanks to the kindness of Mr. BD. ]

About two years ago, one phone call changed my life.

"Hi, this is my cousin Hassen."

I froze

As you know, I have well over 30 cousins, but I didn't know anyone by the name of Hassen.

It turned out that Hassen was actually my mother's cousin and had just arrived in Montreal as a refugee.

And in the coming months, three more relatives will come to Canada to apply for asylum in the clothes they are wearing.

It's been two years since that call and my life has completely changed.

I left academia and now lead a diverse team of technologists, researchers and refugees developing customized self-help resources for newcomers.

We want to help them overcome the language, cultural and other barriers that make their lives feel out of control.

And we feel AI can help restore the rights and dignity that many people have lost when seeking help.

My family's refugee experience is not unique.

According to UNHCR, 20 people are newly displaced every minute due to climate change, economic crisis and social and political instability.

And it was while volunteering at the local YMCA shelter where my cousin Hassen and other relatives were sent that we saw and understood how much effort and coordination the resettlement required.

When you first arrive, you will have to find a lawyer and fill out legal papers within two weeks.

You will also need to make an appointment for a medical examination with a pre-certified doctor in order to apply for your work permit.

And before you can get any social assistance, you need to start looking for a place to live.

Thousands of people have fled the United States in the last few years seeking asylum in Canada. We quickly saw what it was like to have more people in need of help than resources to help them.

Social services don't scale quickly, and even if the community does its best to help more people with limited resources, newcomers end up waiting longer and at a loss as to where to turn.

In Montreal, for example, despite millions of dollars being spent to support resettlement efforts, nearly 50 percent of newcomers are still unaware that free resources exist to help with everything from filling out paperwork to finding work.

The problem is not that this information does not exist.

On the contrary, people in need are often exposed to so much information that it is difficult to make sense of it all.

We've heard the phrase, "Don't give me more information, tell me what to do" over and over again.

And it reflects how extremely difficult it is to know where you are when you first arrive in a new country.

Oh, I have the same problem when I came to Montreal and have a Ph.D.

(laughter) Another member of our team, himself a refugee, said, “In Canada, SIM cards are more important than food because we don't starve to death.”

But having access to the right resources and information can be the difference between life and death.

I will say it again. Having access to the right resources and information can be the difference between life and death.

To address these issues, we built Atar, the first AI-powered virtual advocate to guide you step-by-step through your first week in a new city.

Tell Atar that you need help.

Atar then asks some basic questions to understand your unique situation and determine resource eligibility.

Example: Do you have a place to stay tonight?

If not, would you prefer a women-only shelter?

Do you have children?

Atar then generates a custom step-by-step to-do list that tells you everything you need to know: where to go, how to get there, what to bring, and what to expect.

You can always ask a question, and if Atar doesn't have the answer, it connects you with a real person who does.

But what's most interesting is helping humanitarian and service organizations gather the data and analytics they need to understand the changing needs of newcomers in real time.

It's a game changer.

We have already partnered with UNHCR to bring this technology to Canada and have campaigned in Arabic, English, French, Creole and Spanish.

When we talk about refugee issues, we often focus on official statistics that say 65.8 million people are forcibly displaced worldwide.

But the reality is much bigger than that.

By 2050, an additional 140 million people will be at risk of displacement due to environmental degradation.

And today, today, nearly a billion people already live in illegal settlements and slums.

Resettlement and integration are one of the greatest challenges of our time.

And our hope is that Atar can provide a voice for all newcomers.

Our hope is that Atar can build on existing efforts and reduce pressure on social safety nets that are already unimaginable.

But most importantly for us, our work helps refugees regain the rights and dignity they lost during the resettlement and integration process by providing them with the resources they need to support themselves.

thank you.

(applause)

I grew up in Northern Ireland. At the very northern tip of Northern Ireland, it's frigid.

This was me running around in the backyard in midsummer.

(laughs) I couldn't choose my profession.

It's obvious in Ireland to choose the military, but to be honest it's actually terrible.

(Laughter) My mother wanted me to be a dentist.

But the problem was people kept blowing up everything.

So I actually went to school in Belfast. Everything happened there.

And this was a common sight.

The school I went to was pretty boring.

They forced us to learn Latin and so on.

The teachers at school weren't very fun and sports were either very dirty or very painful.

So I chose to paddle well.

And I was actually rowing a boat here at school until this fateful day when I flipped over in front of the whole school.

And that was the finishing post.

(Laughs) So this was very embarrassing.

However, at that time, our school received a government subsidy and acquired a wonderful computer called the 3DZ research machine, but the programming manual was left untouched.

So a student like me with nothing to do has to learn how to program.

Also around this time, at home, this was the computer people were buying.

It was called the Sinclair ZX80. It was a 1K computer where you bought programs on cassette tapes.

Actually, I've heard there are prerequisites for speaking at TED here, so I'm going to take a short break. I need a photo of myself in the old days with a lot of hair.

So I brought a photo with big hair.

(laughter).

I just want it out of the way.

After the Sinclair ZX80 came the very cleverly named Sinclair ZX81.

(Laughter) And -- do you see the bottom picture?

I have a picture of a man doing homework with his son.

They thought that's what they made it for.

As a matter of fact, we got a programming manual and started making games with it.

We were programming in BASIC, which is a pretty terrible language for games. So I ended up learning assembly language to actually be able to control the hardware.

This is the man who invented it, Sir Clive Sinclair, showing off his machine.

There was a similar one in America, called the Timex Sinclair1000.

Playing the game back then required the imagination to believe that you were really playing Battlestar Galactica.

The graphics were just awful.

Playing this game Death Rider requires an even better imagination.

But of course, scientists could not help themselves.

They started making their own video games.

Here is one of my favorite rabbits. Rabbits are bred there, so the man chooses a lucky rabbit.

It was around this time that we went from 1K to 16K, which was quite a leap.

If you're wondering how much 16K is, this eBay logo is 16K.

And with that amount of memory, someone programmed a complete flight simulation program.

And it looked like that.

I've been flying this flight simulator for years and honestly believed I would be able to fly an airplane by the end of it.

This is Clive Sinclair setting up a color computer.

He is known as the father of video games in Europe.

He's a millionaire and I think that's why he's smiling in this photo.

So I continued making various games for the next 20 years.

Highlights include 'Terminator', 'Aladdin' and 'Teenage Mutant Hero Turtles'.

Since I was from England, they thought the word ninja was a little too mean for a child and decided to call him hero instead.

Personally, I liked the Spanish version of Tortugas Ninja better.

It was much better.

(Laughter) So the last game I made was based on an attempt by the video game industry and Hollywood to actually work together on something and actually get them to do the work instead of licensing each other.

Well, Chris asked me to bring him the stats, so I did.

In 2005 the video game industry was a $29 billion business.

We grow every year.

Last year was the biggest year.

By 2008, we're going to hit the music industry.

It will reach 42 billion by 2010.

43% of gamers are female.

So there are far more female gamers out there than people actually realize.

What is the average age of gamers?

Well, obviously for kids, right?

No, I'm actually 30.

And interestingly, 37 people have bought the most games.

So 37 year olds is our target demographic.

All video games are violent.

Of course, newspapers love to bang on this one.

However, this is not true as 83% of games do not contain adult content at all.

Online game statistics.

I brought you some stuff about "World of Warcraft". 5.5 million players.

I make about $80 million a month from subscriptions.

Just installing it on a computer costs $50, plus about $275 million for publishers.

The game cost about $80 million to make, so it basically pays for itself in about a month.

A player in the game "Project Entropia" actually bought his own island for $26,500.

You must remember that this is not a real island.

He didn't actually buy anything, just data.

But he got great terms for it.

The purchase included mining and hunting rights, ownership of all land on the island, and a castle without furnishings.

(Laughter) This market is currently estimated at over $800 million a year.

And what's interesting is that the market was actually created by gamers themselves.

They found clever ways to trade items and sell each other's accounts in order to make money while playing the game.

A few days ago I popped into eBay to see what was going on, typed in World of Warcraft and won 6,000 items.

My favorite was a level 60 Warlock with lots of epics for $174,000.

That person clearly felt pain while making it.

What do you think these people are doing here when it comes to the popularity of the game?

It turned out that they were listening to video game music performed by the Los Angeles Philharmonic at the Hollywood Bowl in Los Angeles.

That's how the show is.

It may sound cheesy, but it's not.

It's a very, very grand, very beautiful concert.

And the people who went there loved it.

What do you think these people are doing?

In fact, they're bringing their computers so they can play games with each other.

And this is happening in every city in the world.

This is also happening in your local city, but you probably just don't realize it.

Well, Chris told me that he put up a timeline video here a few years ago just to show how video game graphics are getting better.

I would like to update that video to give you a new perspective.

But what I want you to do is try to figure it out.

We are on this curve and the graphics are getting amazingly good.

Probably up to 2007.

But think about what games will look like in 10 years.

So let's start that video.

Video: People have been playing games throughout human history.

As human intelligence and technology evolved, so did the games humans play.

(music) (applause) David Perry: Again, don't look at these graphics and think that's what they are.

That's where we are now, and the curve we're in means that this situation will continue to improve.

This is just one example of the kind of graphics you need if you want a job in the video game industry today.

You have to be a really great artist.

And when you have enough of those guys, you'll want even more fantasy artists who can create places you've never been and characters you've never seen before.

So what I should talk about today is graphics and audio.

But if you go to a game developer conference, what they are talking about is emotion, purpose, meaning, understanding, emotion.

We often hear stories like: Can video games make you cry?

And those are the kinds of topics that we actually really care about.

I met a student who was very good at self-expression. The student agreed not to let anyone see his video until the TED community saw it.

Now I would like to play this video.

This is the student's opinion of the game experience.

Video: Like many of you, I live somewhere between reality and video games.

A part of me, a truly living, breathing human being, has been programmed, digitized, virtualized.

The line in my brain that separates reality from fantasy has finally begun to crumble.

I'm a video game addict and this is my story.

(music) The year I was born, the Nintendo Entertainment System was also developed.

We played in the backyard, learned to read, and ate vegetables.

Most of my childhood was spent playing with Lego.

But like most of my generation, I spent a lot of time in front of the TV.

Mr. Rogers, Walt Disney, Nick Jr. and about half a million commercials have definitely left their mark on me.

When my parents bought my sister and me our first Nintendo, it immediately captivated me, whatever the addictive nature of this early interactive electronic entertainment.

At some point, something clicked.

(music) The simple, interactive story combined with the warmth of television made my simple 16-bit Nintendo more than just an escape.

It became another being, my virtual reality.

(music) I'm addicted to video games, not because I spent a certain amount of time playing them or because I didn't sleep all night trying to pass the next level.

Because I was having a life-changing experience in virtual space, and video games were beginning to erode my own understanding of what was real and what wasn't.

I'm addicted because even though I know I'm losing my grip on reality, I still want more.

(music) From an early age, I learned to be emotionally invested in what was unfolding in front of me on screen.

After 20 years of watching emotionally charged television, even a decent insurance commercial can bring tears to my eyes.

I am just one of a new generation growing up.

It's a generation that may experience more meaning through video games than the real world.

Video games are approaching an evolutionary leap, reaching a point where the game world will look and feel as real as the movies you see in theaters or the news you see on TV.

My sense of free will in these virtual worlds may still be limited, but what I've learned applies to my real life.

Play enough video games and eventually you'll really believe you can snowboard, fly a plane, drive a quarter mile in 9 seconds, or kill someone.

I know I can do it.

Unlike the pop culture phenomenon that preceded it, video games actually allow us to become part of the machine.

These allow us to sublimate into a culture of interactive, downloadable, streaming and HD reality.

We are interacting with entertainment.

I have come to expect this level of interaction.

Without it, the problems we face in the real world – poverty, war, disease, genocide – lack the levity they should.

Their significance blends into the sensational drama of primetime television.

But the beauty of today's video games doesn't lie in lifelike graphics, vibrating joysticks, and virtual surround sound.

It's just that these games are starting to make me emotional.

I've fought in wars, feared for my survival, watched my comrades die on beaches and in the woods, and it looks and feels more real than any textbook or news article.

The people who make these games are smart.

They know what makes me scared, excited, panicked, proud and sad.

These emotions are then used to dimension the world they create.

A well-designed video game weaves the user seamlessly into the fabric of the virtual experience.

As you gain experience, your awareness of body control dissolves.

I know what I want and I do it.

No buttons to press, no triggers to pull, just me and the game.

My destiny and the fate of the world around me are in my hands.

I know violent video games worry my mom.

What bothers me is not that video game violence is becoming more and more like real-life violence, but that real-life violence is starting to look more and more like video games.

(music) These are all problems outside of oneself.

However, I have a problem very close to home.

Something happened in my brain.

(music) Perhaps there is a single part of our brain that houses all of our instincts that we know what to do before we even think about it.

Some of these instincts may be innate, but most are learned and all hardwired into our brains.

These instincts are essential for survival in both the real and virtual worlds.

Only in recent years has the technology behind video games made true duplication of stimuli possible.

As gamers, we now live in the same city, by the same laws of physics, and do many of the same things we once did in real life, but only virtually.

please think about it. The actual mileage on my car is about 25,000 miles.

I've driven a total of 31,459 miles in all my previous driving games.

To some extent, I learned how to drive from games.

Sensory cues are very similar.

It feels funny when you spend more time doing something on TV than in real life.

All I can think of while driving down the road at dusk is that this is as beautiful as my game.

Because my virtual world is perfect.

It's more beautiful and richer than the real world around us.

I don't know what impact my experience will have, but the prospect of repeated use of realistic video game stimuli to vast numbers of loyal participants is terrifying to me.

Today I believe that Big Brother will be far more successful at brainwashing the masses with video games than with mere television.

Video games are fun and engaging, but they leave your brain vulnerable to reprogramming.

However, brainwashing may not always be a bad thing.

Imagine a game that teaches us to respect each other or helps us understand the problems we all face in the real world.

There is also the possibility of doing good things.

As these virtual worlds continue to mirror the real world we live in, it's important that game developers realize they have a lot of responsibility.

We never know what the future holds for video games for our civilization.

But as the experiences of the virtual and real worlds increasingly overlap, it becomes more and more likely that others will feel the same way I do.

What I've recently realized is that beyond the graphics, sounds, gameplay, and emotions, the reality-shattering power is so captivating and addicting to me.

I know I'm losing my grip.

Part of me is just waiting to let go.

But I know that no matter how great video games have become, no matter how flat the real world seems to us, we must remain conscious of what games teach us and what emotions they leave us with when we finally unplug.

(Applause) DP: Great.

(Applause) I found this video very thought provoking. That's why I wanted to introduce it here for everyone to see.

And what's interesting is that my obvious choice to speak was graphics and audio.

But you know, Michael talked about all these other elements as well.

Video games give you so much more, and that's why people get hooked on them.

Most importantly it's fun.

The name of this song is "The Magic To Come".

Who does it come from?

Will it be, as we expected, from the best director in the world?

i don't think so.

I think that comes from kids growing up now who don't cling to everything we remember from the past.

They're going to do it their way, using the tools we created.

The same goes for students, creatives, writers, and so on.

When it comes to universities, around 350 universities around the world teach video game courses.

That means there are literally thousands of new ideas.

Some ideas are really scary, but some are great.

There's nothing worse than having to hear someone try to suggest a really bad video game idea.

(laughter) Chris Anderson: Take a break, take a break. that's it.

he doesn't have time

DP: I have a few more, so please go ahead.

CA: Please. But I will stay here.

(laughs) DP: This is just a cool shot. Because this is the students who come to school after class.

School is closed. They come back in the middle of the night because they want to pitch their video game idea.

I'm sitting at the front of the class and they're actually pitching their ideas.

So it's hard to get students back in class, but it's possible.

This is my daughter, her name is Emma, ​​she is 17 months old.

And I was asking myself what Emma would experience in the world of video games.

As shown here, we have an audience.

She will never know a world where she can't press a button and has millions of people ready to play.

You know, we have the technology.

She will never know a world where the graphics aren't beautiful and it doesn't feel immersive at all.

And as student videos showed, we can shock and move.

She'll never know a world where video games aren't incredibly emotional and will probably make her cry.

I hope she likes video games.

(laughter) So here are my final thoughts.

On the surface, games seem like simple entertainment, but for those who want to think a little deeper, the new paradigm of video games could open up whole new frontiers for creative minds who like to think big.

There's no better place to challenge those ideas than here at TED.

thank you.

Chris Anderson: David Perry. That was amazing.

Hello, I'm Jack. Transgender.

Guess some thoughts that might be running through your head right now.

"Transgender?

Wait, are they really men or women? ”

"Has he had surgery yet?"

Oh look at his crotch now.

Look to your right, it's a safe place. ”

"Yes, I knew it! No real man has a waist like that."

"My friend's daughter is transgender. I wonder if they know each other."

"Oh my god, he's so brave.

I fully support his right to use the men's restroom.

Wait a minute, but how does he use the restroom?

how does he have sex ”

OK, OK, let's stop asking hypothetical questions while I'm not at ease.

So, don't get me wrong, I'm here today to share my personal experience of being transgender, but I didn't want to wake up this morning and tell an entire audience about my sex life.

Of course, it's a matter of being transgender, right?

People are constantly wondering how we have sex and what kind of equipment we have under our belts.

Being transgender is awkward.

It's not just because the gender assigned at birth doesn't match the actual gender.

Being transgender is uncomfortable because it makes me uncomfortable around other people.

People who genuinely support me and other transgender people often never ask because they are afraid to say the wrong thing and are ashamed not to know what they think they should do.

One of the things that made me so nervous about coming out as transgender was knowing people wouldn't understand what I was saying.

And when someone comes out as gay, people know what it means, but when you come out as transgender, even after educating you, you have to face misconceptions that affect how others perceive you...

And we have to educate them.

When I came out, I wrote a 10-page encyclopedic document with music and videos in a zip file and sent it to everyone who came out.

(Laughter.) And I kept it in my email signature for months afterward. Because you didn't stop coming out either.

I came out to an accountant who helped me with my taxes and a TSA employee who didn't know if a man or a woman should pet me.

In other words, it came out in front of everyone watching this.

When I came out to my dad, to my great relief, he was totally okay with me being transgender, but as soon as I started talking about physical transition, he was taken aback.

And I quickly realized it was because he, like so many others, believed that physical transition meant only one thing: surgery.

Now listen, if there was a magical operation that could transform me into the image of a tall, muscular, socially perfect man overnight, I would immediately enroll.

Unfortunately it's not that simple.

There are dozens of gender-affirming surgeries, from chest surgery to hip surgery to facial feminization and male sculpting.

Many transgender people will only have surgery once in their lifetime, if at all.

Probably not only because I personally don't see a need for it, but also because it's expensive and health insurance is just starting to cover it.

Instead, hormone replacement therapy is usually the first step for transgender individuals seeking a physical transition.

Hormones are responsible for my low voice, sparse beard on my neck, and giant pimples on my chin.

Basically they make you go through a second puberty...

it's awesome

(Laughter) Well, our transition is slower and more steady than historical misconceptions lead people to believe, so there can be confusion about when to call someone by a new name or pronoun.

There is no clear point in physical transformation at which a transgender person becomes their true gender.

As soon as they teach you new names and pronouns, you start using them.

Making changes can be difficult.

It may fail here and there. I myself have been mistaken for other transgender people.

But I always think to myself, if I could change Puff Daddy from Puff Daddy to P. Diddy, and if I could apologize profusely when I used the wrong gender pronoun for someone's domestic cat, I mean, I think I could do the same for real humans in our lives.

Well, no topic about transgender people is more offensive than public restrooms.

Oh, it's the toilet. The latest political flashpoint for LGBT opponents.

Here are some fun facts about toilets. More US lawmakers have been convicted of assaulting someone in a public restroom than transgender people.

(Laughter) Actually, we trans people are far more afraid of you than you are of us.

Which toilet to start using and when is a hugely debated topic in the trans community, so it doesn't attract attention that can lead to violence against us.

I was afraid to go into the men's room myself, but I started using the men's room when I started getting confused and scared in the women's room.

And often choose not to go to the bathroom at all.

A 2015 national survey of transgender people found that 8% of people developed a urinary tract infection as a result of avoiding the bathroom in the past year.

No one will pay for this toilet fee.

All they are doing is ensuring that the law is no longer on your side when transgender people report being assaulted in a bathroom.

Being transgender means these misconceptions hit us every day.

And it's so easy.

I am a Caucasian able-bodied person sitting almost at the top of Mt. Privilege.

For nonbinary people, trans women, and trans people of color, it's much harder.

So we have provided a starter pack of transgender knowledge. I hope this leads to further learning on your own.

Talk to transgender people.

please listen.

make our voices louder

Take the heat out of us and educate those around you so they don't have to do it every time.

Maybe one day, when you say, "Hi, I'm Jack. I'm transgender," all I get back is "Hi, nice to meet you."

thank you.

(applause)

I thought about it.

I'm going to kill my father

I called my sister.

"Listen, I'm just thinking.

kill your dad

I'm going to take him to Oregon to find some heroin and give him. ”

My father has Frontotemporal Dementia (FTD).

It is a complicated disease that people in their 50s and 60s are more likely to get.

It can completely change a person's character, becoming paranoid and even violent.

My father has been sick for 10 years, but 3 years ago he became very ill and I had to kick him out of the house. The house I grew up in, the house he built with his own hands.

At the age of just 65, my father, a toned, cool man with a falsetto voice, ended up in a facility for 24-hour care.

At first my mother, sisters and I made the mistake of putting him in a regular nursing home.

It was really beautiful. There were gorgeous carpets, an afternoon art class, and a dog named Diane.

But then I got a call.

"Mr. Malone, we have arrested your father."

"what?"

"Well, he threatened everyone with a knife.

Then he pulled the curtains off the wall and tried to throw the plant out the window.

Then he pulled all the old ladies out of their wheelchairs. ”

"Is it just the grannies?"

(Laughter) "What a cowboy."

(Laughter.) After he was kicked out of there, we shuttled him between several state-run facilities until we found a treatment center for people with dementia.

At first he liked it, but over time his health deteriorated and one day I came into the house and found him sitting hunched over on the ground in a costume.

I watched him pull it off trying to find a way out of this thing for about an hour.

It should be practical, but it looked like a straitjacket to me.

So I jumped out.

I left him there.

I sat in my truck—his old truck—and leaned forward, and a really deep, guttural scream came out of my pit.

I couldn't believe that my father, my young Adonis, my very dear friend, would think that this kind of life was worth living anymore.

We are programmed to prioritize productivity.

So when a person, in this case Adonis, loses the productivity that we expect him to have, what value is left in his life?

All I could imagine in the truck that day was that my father was being tortured and his body was the torture vessel.

I have to get him out of that body.

I have to get him out of that body. kill your dad

i will call my sister

"Beth," she said.

"You don't want to spend the rest of your life knowing that you killed your father.

And you think you'll get arrested because he can't stand it.

And they don't even know how to buy heroin. ”

(Laughter) True, I'm not.

(Laughter.) Actually, we talk a lot about his death.

When will it happen? What will it be?

But I wish we had discussed death when everyone was healthy.

What would my best death look like?

What would your best death look like?

But my family didn't know to do so.

And my sister was right.

You shouldn't kill him with heroin, but you have to take him out of his body.

So I went to a psychic.

Then the priest, then the support group, and they all said the same thing. Sometimes people stop when they are worried about their loved ones.

Tell them you're safe and you can go when you're ready.

So I went to see my father.

I found him crouching on the ground in his costume.

He was staring at me, just looking at the ground.

I handed him some ginger ale and started talking about nothing in particular, but he sneezed on the ginger ale while we were talking.

And a sneeze made his body move vertically, bringing him back to life just a little bit.

And he just drank and sneezed and sparked and did it over and over until it stopped.

And I heard, "Hehehehehe, hehehehehe..."

This is so great.

This is so wonderful. ”

He was looking at me with his eyes open and I said, "Hi, Dad!"

And he said, "Hi, Beth."

And I opened my mouth to tell him, right?

"Father, if you want to die, you can die.

we are all okay. ”

But when I opened my mouth to tell him, all I could say was, "Dad!"

I mıss you. "

and he said: "Yes, I miss you too."

And I just messed up, so I fell.

So I fell and was sitting there with him. Because for the first time in a long time, he seemed somehow okay.

And I remembered his hands and was so grateful that his soul was still attached to his body.

And at that moment I realized that I was not responsible for this person.

I'm not his doctor, I'm not his mother, and of course I'm not his God, and perhaps the best way to help him and I is to resume our roles as father and daughter.

So we sat there quietly as usual.

No one was productive.

We are both still strong.

"Okay, Dad. I'm going, but I'll see you tomorrow."

“Okay,” he said.

"Hi, this is a very nice farm."

thank you.

(applause)

So I want to talk about climate and change, but it's really about humans, not polar bears.

This is the house we lived in in the mid 2000's.

I was the Chief Operating Officer for the Navy's Meteorological and Marine Operations.

It just so happened to be in the Stennis Space Center on the Gulf Coast, and we lived in a nice, modest house in the small town of Waveland, Mississippi, which, as you can see, is exposed to storm surge.

Well, if you've ever wondered what a 30-foot or 9-meter storm surge hitting your city would do, let me show you.

Same house.

That's me, wondering what's next.

But when we say homeless, which is right after Katrina, home is either far above the railroad tracks or somewhere down in the Gulf of Mexico. And to this day, we are truly homeless.

I don't know where it is.

(Laughter) As you know, it's gone.

So this is not for pity. Because in many ways we were the luckiest people on the Gulf Coast.

One is that we had insurance, and the idea of ​​insurance is probably pretty important there.

But does this scale up, what happened here?

Because, as you've heard, as sea levels rise, storms need to get weaker and weaker for this to happen.

So let's step back and look at this.

And, you know, the climate is very complex and there are many moving parts to this, but I said it's all about water.

See those three blue dots at the bottom?

What you can easily see is all the water in the world.

Those two little dots, they're freshwater.

And it turns out that the distribution of that water is fundamentally changing as the climate changes.

So now we have too much, too little, the wrong place, the wrong time.

Salty where it should be fresh. Liquids should be frozen. Wet places that should be dry. And indeed, the very chemistry of the ocean itself is changing.

And what it does on the security or military part, it does three things. It changes the very operational environment in which we are working and threatens our bases. And it comes with geopolitical risks. This sounds kind of fancy, but I'll explain what this means in a minute.

So let's look at some examples here.

And let's start with Syria, the political and humanitarian catastrophe that everyone knows of course.

It turns out that one of the causes of the long chain of events was the climate.

Actually it started in the 1970s.

When President Assad ruled Syria, he decided he wanted to be self-sufficient in things like wheat and barley.

Now you want to think that someone said to President Assad's Oval Office: "Hey Boss, we're in the Eastern Mediterranean and it's a bit dry here. Might not be the best idea."

But I think what happened was, 'Boss, you're a smart, strong, handsome man.

And they did.

So, by the 90s, believe it or not, they were actually self-sufficient in food, but at a great cost.

They did it at the expense of aquifers, at the expense of surface water.

And, of course, there are many other non-climatic issues that have affected Syria.

There is the Iraq War, and as you can see by the blue line below, over a million refugees are pouring into the city.

And about 10 years ago, we had this ferocious heat wave and drought, leaving fingerprints all over the place, yes, this is actually related to climate change, but 550,000 more farmers were forced into the same city.

why? because they had nothing.

There was dust. It was dirty. they had nothing.

So now they are in the city, the Iraqis are also in the city, it's Assad, he's not taking care of the people, and suddenly we have a big problem here of massive instability and a hotbed of extremism.

This is why the security community calls climate change a risk to instability.

This is where instability accelerates.

Simply put, it makes a bad place worse.

So let's go to another place here.

We are now 2,000 kilometers north of Oslo, or about 1,200 miles, and only 600 miles from the North Pole. This is probably the most strategic island you've ever heard of.

A place called Svalbard.

It straddles the sea lanes necessary for the Russian Northern Fleet to escape and enter warm waters.

It is also a place where, thanks to its geography, it can control all polar orbiting satellites in any orbit.

It is a strategic high ground in space.

Climate change has led to much less sea ice in the area, and much more human activity, which has become a flashpoint, and indeed NATO parliament will meet here in Svalbard next month.

Russians are very unhappy about it.

So if you want to find a flashpoint in the Arctic, look at the Svalbard archipelago there.

Now, in the military, whether it was a hurricane, a typhoon, or a strategic shift, there was a time to be prepared before it hit, and we've known for decades, if not centuries, that Admiral Nimitz was right there.

That's the time to prepare.

Fortunately, our Secretary of Defense, Secretary Mattis, understands that, and he understands that climate change is a risk.

"It's my job as secretary of defense to manage those risks," he said in a written response to Congress.

The U.S. military isn't the only one who understands this.

Many of our friends and allies in other navies and other militaries have very clear views on climate risk.

And indeed, in 2014, I had the honor of speaking in a half-day seminar on the subject before 70 Navy leaders at the International Seapower Symposium.

So Winston Churchill was quoted as saying, I don't know if he said anything, that Americans can always be expected to do the right thing after exhausting all possibilities.

(Laughter) So I would argue that we are still in the process of exhausting all possibilities, but I believe we will win.

But I need your help.

This is my request.

What I'm asking is not to bring out the recyclables on Wednesday, but to engage with every business leader, every technology leader, every government leader and ask, "Ma'am, what are you doing to stabilize the climate?"

It's that simple.

Because if enough people were interested, politicians, most of whom would not try to take the lead on this issue, would take the lead, and that would change the situation.

Because I can tell you ice doesn't matter.

Ice doesn't care who's in the White House.

It doesn't matter which party controls parliament.

It doesn't matter which party controls parliament.

It just melts.

thank you very much.

(applause)

When I was four years old, my father taught me the Taos Pueblo Hoop Dance. The Taos Pueblo Hoop Dance is a traditional dance that originated in the American Southwest hundreds of years ago.

A series of hoops are made from the willow tree and strung together with threads to create a natural sculpture, representing the many beauties of life.

In this dance, they whirl in constant rotation, mimicking the movement of the sun and the passage of time.

Watching this dance was magical to me.

Like a time capsule, I was peering into the past through cultural windows.

I felt a deeper connection to how my ancestors viewed the world around them.

Since then, I've been obsessed with time capsules.

They take many forms, but what they have in common is that they are gateways to memory and have the vital power to keep stories alive, which makes them uncontrollably fascinating to us humans.

As a filmmaker and composer, it has been my journey to find my voice, reclaim my heritage and stories from the past, and inject them into music and film time capsules to share.

To tell you a little bit about how I found my voice, I want to tell you a little bit about how I grew up.

In Southern California, I grew up in a multigenerational home. I mean, I lived under the same roof with my parents, aunts, uncles, and grandparents.

My mother is Dutch-Indonesian and Chinese of immigrant parents, and my father is Ojibwa, a registered tribal member of the Potawatomi Nation of the Prairie Bands of northeastern Kansas.

So one weekend I learned how to fold dumplings, and the next I danced in traditional style at a powwow to the powerful sounds of drums and singers.

Being surrounded by so many cultures was the norm, but it was also a very confusing experience.

It was really hard for me to find my voice. Because I never felt like I was good enough, and I wasn't good enough Chinese, Dutch-Indonesian, native.

I never felt like I belonged to any community, so I tried to learn the stories of my traditions and connect them to rediscover my own story.

Music was the first medium that I felt gave me a voice.

Using layers of sound and multiple instruments, I was able to create soundscapes and worlds much larger than my own.

Through music, I invite you to the sonic portal of my memories and emotions, holding up your mirror.

One of my favorite instruments to play is the Gusin, a Chinese harp-like instrument.

Hoop dancing is hundreds of years old, but guzheng is over 2,000 years old.

I use instruments that were once used to play traditional folk music to play electronic music and other styles that have a great influence on me today.

And I noticed an interesting relationship. The zither is tuned to the pentatonic scale, which is widely known in numerous parts of music around the world, including Native American folk songs.

I find this inherent sound of longing and clinging to the past in both Chinese and native folk, and it's a sentiment that largely drives the music I create today.

At that time, I wondered if I could make this immersive feeling even stronger by layering images and images on top of images and music.

So I turned to internet tutorials to learn editing software, attended community colleges to save money, and made movies.

After several years of experimentation, at the age of 17, there was something I wanted to tell and leave behind.

It started with the question, "What happens when stories are forgotten?"

My latest documentary, Smoke That Travels, begins with this, drawing people into a world of music, song, color and dance, exploring the fear that part of my identity, my indigenous traditions, will soon be forgotten.

Many indigenous languages ​​are disappearing due to historically forced assimilation.

From the late 1800s to the early 1970s, indigenous peoples were forced into boarding schools where they were violently punished for practicing traditional methods or speaking their native language.

Today there are 567 federally recognized tribes in the United States, but there used to be many more.

In the words of my father, "Being native is not about having long hair in braids.

It's not about feathers and beadwork.

It's about how we all, as human beings, put ourselves at the center of the world. ”

After traveling with this film for over a year, I met indigenous peoples from all over the world, including the Japanese Ainu, the Scandinavian Sami, and the Maori.

And they were all fighting the exact same struggle to defend their language and culture.

In this moment, I recognize not only the need for power storytelling to bring us all together as humans, but also the responsibility that comes with this power.

It can be very dangerous if our stories are rewritten or ignored. Because when our identity is denied, we become invisible.

We are all storytellers.

By simply taking back our stories and listening to each other's stories, we can create a portal that allows us to transcend time itself.

thank you.

(applause)

I come from five siblings, all scientists and engineers.

A few years ago I sent them the following email: "Dear brothers, this message wishes you all the best.

I am writing to let you know that I am dropping out of my master's degree in engineering to pursue a career as a full-time musician.

All I ask of you is don't worry about me. ”

Brother number 1 answered.

He was encouraging, but a little skeptical.

“I wish you luck,” he said.

you will need it. ”

(Laughter) The second brother was a little skeptical.

He said, 'Don't do that!

This will be the worst mistake of your life.

Find your real career. ”

(Laughter.) Well, the rest of the brothers were so enthusiastic about my decision that they didn't even react.

(Laughter.) I know the suspicion from my brothers comes from their concern and concern for me.

they were worried.

They thought it would be difficult and challenging to succeed as an artist.

And what do you know? they were right.

Becoming a full-time artist is very challenging.

I have a lot of friends who need a side job as Plan B to pay their bills. However, plan B can also become plan A.

I and my friends are not alone in this experience.

According to the U.S. Census Bureau, only 10 percent of art school graduates end up working as full-time artists.

The remaining 90% have changed jobs and are working in areas such as marketing, sales and education.

But this is not news, is it?

We almost expect this artist to be a struggling artist.

But why should we expect that?

I read the Huffington Post article. Four years ago, the European Union launched the largest arts funding effort in world history.

Creative Europe will donate $2.4 billion to over 300,000 artists.

In contrast, the US budget for the National Endowment for the Arts, the single largest funder of the national arts, is just $146 million.

To put things into perspective, the US budget for military marching bands alone is almost double the entire NEA.

In another striking image, Brendan McMahon contributed to the Huffington Post, stating that allocating just 0.05 percent of the $1 trillion budget for military and defense spending to the arts could pay 20 full-time symphony orchestras at $20 million apiece and give over 80,000 artists an annual income of $50,000 each.

If it's only 0.05 percent, imagine what you could do with 1 percent.

Well, we live in a capitalist society and know that profit is very important.

Now let's look at it from a financial perspective.

The US nonprofit arts industry generates more than $166 billion in economic activity, employs 5.7 million people, and generates $12.6 billion in tax revenue.

But this is just from a financial point of view, right?

We all know that art has more than just economic value.

Art brings meaning to life.

It's the spirit of our culture.

It connects people and supports creativity and social cohesion.

But if art contributes so much to our economy, why are we still investing so little in art and artists?

Why are more than 80% of schools nationwide still receiving cuts in arts education programs?

What are the values ​​of art and artists that we do not yet understand?

I believe this system is flawed and far from fair, and I want to help change it.

I would like to live in a society where artists are valued more and receive more cultural and financial support. That way, they can focus on creating art instead of being forced to drive an Uber or work for a company they don't want.

However, there are other sources of income for artists.

There are private foundations, grants and patrons who provide funding, but the vast majority of artists are unaware of these opportunities.

On the one hand, there are organizations and people with money.

On the one hand, there are artists who want funding, but artists don't know people who have money, and people who have money don't necessarily know artists in the world.

That's why I'm so excited to share 'Grantpa'. This online platform uses technology to match artists with grants and funding opportunities in an easy, fast, and less intimidating way.

Grantpa is just one step in solving the existing problem of funding inequality, but we need to work together on many fronts to re-evaluate how society views artists.

Do we think of art as a luxury or a necessity?

Do we understand what goes on in the daily lives of artists, or do we still believe that no matter how hard they struggle, they are happy simply because they follow their passions?

In a few years, I will email my brothers:

I sent an email to let you know that I am doing great, as are the hundreds of thousands of artists who are culturally and financially more valued and have enough money to focus on their craft and create more art.

Thank you for your support.

I couldn't have done it without you. ”

thank you.

(applause)

I want to take you back to basically my hometown, and a photo of my hometown the week Emergence was released.

And I've seen this photo many times.

Basically, "Emergence" came out on 9/11.

I live in the West Village there so luckily the plume was blowing west away from us.

We had a two-and-a-half-day-old baby in our house, but it wasn't adopted from someone else.

(Laughter) And one of the things I thought about dealing with these two separate events, the book and the baby, and how this happened so closely together, was that when I was still in my apartment looking at it, or I was out on the street looking at it right in front of the building, my first thought was that I had made a terrible miscalculation with the book I had just written.

Because a lot of that book celebrated the power and creative potential of density—mainly urban density—to bring people together, bring them together, line them up on sidewalks to share ideas, share physical space.

And watching that, watching that tower burn and fall, watching that tower burn and fall, it really seemed to me that one of the lessons here was that density kills.

And of all the technologies exploited to bring about that carnage, perhaps the group of technologies that took the most lives was the one that allowed 50,000 people to live in two 110-story buildings.

If it weren't for the crowds, you'd see that very strongly when comparing the loss of life at the Pentagon to the Twin Towers.

So I started thinking density, density, I don't know if that's the right decision.

And I ruminated on it for days.

After about two days, the wind direction began to change a little, and I felt that the air was unhealthy.

So, even though we didn't have a car yet in the West Village where we lived, my wife sent me to Bed Bath and Beyond about 20 blocks north to buy a big air filter.

So I went out.

And obviously I'm a very strong person physically, as you can see -- (laughter) -- so I wasn't worried about carrying this 20 blocks.

And then I went outside. Something truly miraculous happened when I was walking north to buy this air filter. That is, the streets were completely crowded with people.

It was an incredible day. As you know, that day went on for about a week after that, and it was a great day. The West Village has never looked more vibrant.

I walked along Hudson Street--where Jane Jacobs lived and wrote her wonderful book, which greatly influenced what I wrote in Emergence--the White Horse Tavern, past that great old bar where Dylan Thomas drank to death, and the playground of Bleecker Street filled with children.

And all the people who lived in the neighborhood, who owned the restaurants and bars in the neighborhood, were out, and they were all open.

people were out

In some ways, it seemed even better because we didn't have a car.

It was a beautiful city day, but surprisingly the city was working.

The city was there.

Everything that makes a great city successful, and everything that makes a great city exciting, was on display in that street.

And I thought that this is the power of the city.

It's the power of the city. We talked about cities being spatially concentrated, but what makes cities so powerful is that most of the time their functions are decentralized.

They don't have a central executive branch that you can eliminate and screw the whole thing up.

If so, it was probably right there at ground zero.

In other words, the emergency bunker was right there, but was destroyed by the attack, apparently causing damage to the building and life.

But nevertheless, just 20 blocks north, two days later, the city looked more vibrant than ever.

If you've been in people's minds, you've seen a lot of trauma, a lot of heartache, and a lot of recovery that takes a long time.

However, the city system itself was thriving.

So when I saw it, it gave me courage.

So I wanted to talk a little bit about why it works so well and how some of those reasons relate to the current direction of the web.

Then, when we were talking about this book, the question I asked people was, when you talk about emergent action, when you talk about collective intelligence, the best way to get people to get their heads around is to ask, who is building the neighborhood?

Who decided that Soho should have this character and the Latin Quarter should have this character?

Well, there are some kind of administrative decisions, but in most cases the answer is "everyone" and "no one".

Everyone contributes a little.

No one determines the personality of a neighborhood.

The same goes for the question of who animated the streets in my neighborhood after 9/11.

Well, it was the whole city.

The whole system is working on it and everyone contributes a little bit.

And this is what we're starting to see on the web in all sorts of interesting ways. In fact, most of it didn't exist when I was writing Emergence and when the book came out, except for some very experimental ones.

I think it was a very optimistic time and I would like to share some of those things with you.

In effect, I believe that a new kind of interactivity model is beginning to emerge online.

And the old one looked like this.

This looks like a future King of England, but it's not.

It's a man. This is the GeoCities home page of a guy I found online. If you look at the bottom, you're interested in football, Jesus, Garth Brooks, Clint Beckham, and "My Hometown." These are his links.

But nothing says more about this model of interactivity--very exciting and a real-life capture of the 1995 Web zeitgeist--than "Click here to see a picture of my dog."

As you know, I don't think there is a sentence that reminds me of the times at that time. All of a sudden, you have the power to post a picture of your dog and link to it, and someone reading the page has the power to decide whether or not to click on that link.

And you know, I don't want to take that lightly. It was, in a way, to quote what Jeff was talking about yesterday, the kind of interface electricity that fueled the explosion of interest in the web. You put a link in there and someone can click on it and it will take you anywhere you want to go.

But it's still very much a one-to-one relationship.

There's someone putting up the link, and on the other side, someone trying to decide whether or not to click on it.

The new model looks a lot like this, and we've already seen some references to it.

This is what you get when you search for "Steven Johnson" on Google.

About two months ago, I made great progress. One of my crowning achievements is that my website finally made it to the top of search results for "Steven Johnson."

We have a theoretical physicist at MIT named Steven Johnson, and I'm glad he dropped two places.

(Laughter) And I mean, we're going to look at some of this stuff, but Google is clearly the best technology ever invented for navel-gazing.

However, when you look at it, there are many people in the navel.

Because in effect what's going on here is obviously creating this page -- which everyone knows, but it's worth thinking about for a second -- because it's not someone deciding that I'm Stephen Johnson's first answer, but a whole web of people who somehow set up a page and decide whether or not to link to my page, and Google is just sitting there running the numbers.

In other words, collective decision-making is taking place.

This page is effectively collaboratively authored by the web, and Google is just helping to bring authors together in some kind of coherent place.

Now they're more innovative -- well, Google is pretty innovative too -- but there are some new twists to this.

There's an incredibly interesting new site called Technorati that's full of little widgets that extend these.

And these are looking into the world of blogs and the world of weblogs.

He basically analyzes every weblog he tracks.

And he keeps track of the number of other weblogs that link to those weblogs, so he has some kind of authority. A weblog with many links is more authoritative than one with few links.

So at any time, any page on the web can really say what the weblog community thinks about it.

And then you can get the list.

This is what they think of my site. Ranked by blogging authority.

You can also rank in order of the most recent posts.

So when I spoke on "Emergence," I talked about the limitations of one-way link architecture, where you can basically link to someone else, but that person doesn't necessarily know you're pointing to them.

That was one of the reasons why the web didn't emerge as it should. I needed a two-way link to do something really interesting, and I needed that kind of feedback mechanism.

Well, something like Technorati offers that.

Now, what's interesting here is that this is a quote from Dave Weinberger. He says there that everything on the Web is intentional, nothing artificial.

There's a line where he says he's going to put the link there, and if someone finds the link, someone decides to put it there.

And links to one site didn't just grow "like a mushroom" to other pages, he says.

And actually, I think that's not entirely true anymore.

Placing a feed of all Technorati-generated links on the right side of the page means that the links will change as the overall web landscape changes.

The small list there will change.

I don't really have direct control over it.

So it's, in some ways, much closer to the data fungus that wound up on that page than the intentional links I put there.

Now, what you have here is basically a global brain that can do many kinds of experiments to see what it's thinking.

And then there are all these interesting tools.

Google does the Google Zeitgeist, where they look at search requests to test what's going on and what people are interested in, and publish it with lots of fun graphs.

I have a lot of good things to say about Google, so I'll say one thing that's a little critical.

The Google zeitgeist has a problem. It often comes up in the news that many people are searching for Britney Spears photos, but this is not necessarily news.

The Columbia exploded and suddenly there was a flood of searches for Columbia.

Well, that should be expected.

It's not necessarily something we didn't know yet.

So the important thing about these new tools that plumb deep into the global brain and pump a kind of micropigment through all the bloodstream is, are we finding anything new?

One thing I've experimented with is called Google Share. It basically takes an abstract term, Googles that term, and searches for someone's name in the returned results.

So basically, the pages that mention this term, the number of pages that also mention this page, and the percentage of those pages is that person's Google share for that term.

Then you can have an interesting contest.

For example, this is the Google share of the TED conference.

That means Richard Saul Wurman has about 15 percent of Google's share of TED conferences.

Our good friend Chris has about 6 percent, but I might add that as a bullet.

(Laughter) But what's interesting is that you can broaden your search a little bit.

And in fact, 42% turned out to be sunfish.

I had no idea.

No, it's not.

(laughs) I made this because I wanted to post a sunfish slide.

(Laughter) So did I. I'm not going to start a bit of a fistfight in the next panel, but I did a Google share analysis on evolution and natural selection.

Now, this is a big category, but the percentage is getting smaller, so this is 0.7 percent. Dan Dennett will speak soon.

Just below him, 0.5 percent, Stephen Pinker.

So Dennett has a bit of a lead.

But what's interesting is that you can broaden your search to see what's actually interesting and see what else there is.

So Gary Bauer isn't far behind either - with slightly different theories about evolution and natural selection.

And right behind him is L. Ron Hubbard. So -- (laughter) As you can see, we're in Ascot, and that's always a good thing.

By the way, Chris, I think it was a really good panel.

(Laughter) Hubbard seems to have started reaching, but other than that, I think next year will be good.

One more quick note. This is a little different, but you may have seen this analysis before.

It just came out. If you look at the historical record of the State of the Union address, it's an explosive word.

So these are words that started popping up out of nowhere, like memes that started to spread that had little historical precedent.

First word, this is an explosive word circa 1860s. Slavery, emancipation, slavery, rebellion, Kansas.

That's Britney Spears. I mean, you know, it's interesting.

They are talking about slavery in 1860.

1935 -- Relief, Depression, Reconstruction Bank.

Well, I didn't learn anything new there either - it's very obvious.

In 1985, in the middle of the Reagan administration – we were there, we were there.

(Laughter) Well, there's one way to interpret this. That is, "liberation" and "depression" and "recovery" all have many syllables.

So you can actually download it. These are hard to remember.

But seriously, what you can actually see there is Reagan reinventing the political language of this country, moving it into a more intimate, more folksy, more telegenic language in a way that would otherwise be very hard to detect. That is, all verbs are shortened.

You know, 20 years ago it was still "Don't ask what you can do," but in President Reagan's case it became something like "There's Nancy and I."

We kind of knew, but you weren't actually syntactically aware of what he was doing.

I will go very early.

The question here, and it's a really interesting question, is what higher-order shapes are currently emerging in the web ecosystem as a whole, and the blogging ecosystem in particular. Because blogs are really on the cutting edge.

And I think what happened there happens in the broader system as well.

Well, about a month ago there was a very interesting article by Clay Shirky that got a lot of attention. It basically distributes links to all these various blogs around the web.

It follows a power law, with some very well-linked popular blogs and a long tail of blogs with few links.

So 20% of blogs get 80% of links.

This is very interesting.

This caused a lot of controversy as people thought this was the ultimate in-person modern democracy where anyone could go out and make their voice heard.

The question then becomes, "Why is this happening?"

It is not imposed from above by fiat currency.

It is now a new property of the blogosphere.

Now, the great thing about this is that people are working on it. Within seconds of Cray publishing this article, people started working on changing the underlying rules of the system so that other forms began to emerge.

And basically, such a shape manifests itself by a kind of first-mover advantage.

If you are the first site, everyone will link to you.

If you are the second site, most people will link to you.

And you can accumulate a bunch of links very quickly, which makes it more likely that newcomers will link to you in the future, and you get something like this.

So what Technorati's Dave Sifry started working on was basically giving newcomers a new kind of priority, literally the same as Shirky started after he published his paper.

And he started noticing an interesting newcomer who didn't have many links and suddenly had a lot of links in the last 24 hours.

So, in a way, the explosive weblog is coming from a new voice.

So he's working on a tool that can actually change the entire system.

And it creates a kind of planned emergence.

Because you're not in complete control, but you're changing the underlying rules in interesting ways, perhaps with the end result of a more democratic voice-spanning.

So the most amazing thing about this, and this is the end, is that most emerging systems, most self-organizing systems, are not made up of component parts that can look at the pattern as a whole and change their behavior based on whether they like the pattern or not.

So I think the nicest thing about this whole discussion about the power law and the software that might change it is the fact that we're discussing it.

Hope it continues here.

Thank you very much.

What would happen if someone who had lived on the streets for many years, had mental health problems, and was an alcoholic was brought directly from the street into the house?

I heard this was done in New York City and it was called the Housing First Model.

We wondered if it would work in Utah as well.

So I decided to create a pilot to make that decision. Keta was one of 17 chronically homeless people included in the pilot.

She had been living on the streets for over 20 years, had mental health problems and was a severe alcoholic.

On her first night in the apartment, she put her belongings on the bed and slept on the floor.

For the next three nights, she slept outdoors by a trash can near her apartment.

With the help of her case manager, she returned to her apartment but continued to sleep on the floor for several nights.

It took more than two weeks before she started sleeping in her bed before she developed enough trust and confidence that the apartment was hers and that it would not be taken away.

Homelessness is an ongoing challenge for many cities in our country.

The homeless population falls into three main categories. People who are temporarily homeless (about 75 percent). Temporarily homeless, about 10 percent. And about 15% are chronically homeless.

Chronic homelessness is defined as an unaccompanied adult who has been homeless for at least 1 consecutive year or more than 4 times over a 3-year period for a total of 365 days or more.

This mere 15 percent of the homeless population can consume 50 to 60 percent of the homeless resources available in the community.

In addition, the costs of emergency services, such as hiring paramedics, emergency department visits, addictions, police interactions, and jail time, can cost communities between $20,000 and $45,000 per person per year.

Simply put, this small population costs a lot of money.

Based on this reality, the US government launched an initiative in 2003 calling on states, cities, and counties to come up with plans to end chronic homelessness in 10 years.

Utah accepted the invitation and I was asked to lead this effort.

In 2005, we approved a 10-year plan, and 10 years later, in 2015, we reported a 91 percent reduction in the chronically homeless population statewide.

(Applause.) Great.

When I started this process, and when we started this process, I realized that I had a limited understanding of homelessness and the factors that affect it, and that I needed to make some pretty big shifts in my beliefs and ways of thinking. Because I was raised with stubborn individualism and the "pull yourself down" theory.

That philosophy came from growing up on our family ranch in a small town in the western Utah desert.

On the ranch, I learned that nothing takes precedence over cattle care, that something always needs to be fixed, and most importantly, hard work is what makes the world right.

I got to see homeless people through that lens.

When I was a teenager, my family would go to Salt Lake City and I would see homeless people (“hobos” as they called them then) sitting on the street and I would think, “You lazy people, do your job, pick yourself up.”

After high school, I left my ranch, went to college, worked for the Ford Motor Company for a few years, and then moved back to Salt Lake City to join The Church of Jesus Christ of Latter-day Saints.

During that tenure, I had the opportunity to be seconded to the state's largest homeless shelter to help develop and improve their financial and administrative capabilities.

It was there that I discovered a new approach to dealing with the homeless and drug addicts.

It was called the harm reduction model and consisted of distributing clean needles and condoms.

And I thought, "That's a stupid idea."

(Laughter) "It just encourages them to continue with that behavior.

Just tell them to stop. ”

Years later, I read part of an early federally promoted 10-year plan to end chronic homelessness.

I read those plans and thought, "Hmm, this is unrealistic."

Homelessness cannot be eliminated.

There are too many personal choices and factors out of our control. ”

But when I attended a conference in 2003 and learned the reasoning behind the ten-year plan, my perspective changed.

The first was that this small group of homeless people, at 15 percent of the population, was very expensive.

It was a given for a conservative state like Utah.

The second realization is what I learned about this Housing First, or low-barrier housing.

In New York City, there was an agency that recruited homeless people with mental disorders to move into housing directly from the street.

And they were allowed to continue using drugs and drinking just like we can at home.

In addition, they were provided with non-mandatory access to services by an on-site case manager to help them adjust to their new living environment and stabilize their lives.

They used a harm reduction model.

And even though my initial expectations were low when I heard about this model, they showed an amazing success rate. After 12 months, 85 percent were still incarcerated.

The third is the importance of building trusting relationships.

These people had been abused for most of their lives, so they could trust almost nobody, and clean needles and condoms and low-barrier housing were the means to start building trust.

important.

So when I got home from this conference and sat on the plane looking out the window, I realized my understanding and perspective of the homeless had changed.

And as I stared out that window, a very strong feeling and thought came to me that if there was a state that could end chronic homelessness, it would be Utah. Because, at the root, there is a feeling, a desire and a willingness to work together to serve our neighbors, including the homeless.

A new vision was becoming clear as to how this could be achieved.

Well, we went to the conference and said, "Oh, these models could work in Utah."

But when we got home, there were a lot of people saying, 'No, that's not going to work. It's not going to work here.'

But there was an affordable housing organization willing to build the first 100 units.

But they were concerned about having 100 chronically homeless people in one place.

To address this concern, we decided to create a pilot to test the idea while building the first 100 units.

You will be using existing units scattered throughout Salt Lake City.

So we debated whether we should pick the homeless who are fairly high functioning or the hardest homeless we could find.

This is where my ranch background came to life.

Back then, my mother cooked our meals on a wood-and-coal stove and boiled water for our weekly baths.

And after years of cutting wood for the stove, I learned to cut the big end of the log first when I had the most energy.

We decided to use a "big end of the log first" approach and selected 17 of the most difficult, difficult and chronically homeless people we could find. I knew I could learn the most from them.

Twenty-two months later, all 17 people are still in custody, including Keta, who is now sleeping in his own bed and sober, 11 years later.

At the end of this pilot, one of the young case managers said, "We often discussed in college classes which case management theories were most effective.

Well, our case management theory is whatever it takes to keep patients in. ”

We became believers and built hundreds of units over the next 10 years, leading to a 91 percent reduction in the statewide chronic homeless population.

So who are the homeless?

Many just want them to be gone, disappear and not disrupt our lives.

Through this 10, 11 year process, I have gained a lot of insight into why people become homeless.

One of those insights came to me several years ago during a visit with a medical support team.

They are the frontline workers who visit the homeless and prostitutes on the streets and check their health.

One team member said eight of the prostitutes gave birth to 31 children, who became state wards.

They also shared that some of the pimps were their husbands, or worse, their parents.

These prostitutes, in their late teens, 20s and early 30s, were expected to earn enough a day to support their $100 a day heroin addiction, living expenses and pimps.

And unprotected sex pays more, and predictably, this will lead to pregnancy.

Children born in this situation often end up homeless.

And there's no point in not feeling a little despair when you see people born in that situation, parents who turn their children into drug addicts at age 7, or generations of babies born to drug addicts.

For me, I believe that everyone has value, no matter who they are.

And it doesn't help to look at someone who had such a start in life and blame them for what they are now.

(Applause.) No one grows up saying, "My goal in life is to be homeless."

That is the beauty of harm reduction and housing first model.

Recognize the complexity of the many factors that shape human life.

These models meet people where they are, not where we are or where we think they should be.

Our 17 pilots have taught us many lessons.

If people have lived on the streets for years, they have a lot to learn to move back into housing.

And Donald taught us some of the transition lessons.

His case manager asked him why he didn't turn up the heat in his cold apartment.

Donald said, "How do you do that?"

He taught me how to use the thermostat.

The case manager also noticed that he was warming up a can of beans on the stove, just as he had done over the campfire for years.

I learned how to use pots and pans.

I also learned that he had a sister whom he hadn't seen in 25 years and who thought he was dead.

She was happy to find out otherwise and they soon reconnected.

Hundreds of people like Keta and Donald are currently being held and reunited with their families.

Also, many of our communities have reduced costs for emergency services.

I have learned many times that when you open your heart to listen to someone, put yourself in their place and walk with them, you are compelled to love, care for and serve them.

This is why I am dedicated to continuing to give hope and support to the homeless people I consider to be my brothers and sisters.

thank you.

(applause)

A sky blue canvas torn apart by a giant skull.

Teeth exposed with visceral oils and spray paint.

In 2017, this untitled work was auctioned for over $110 million.

But it is not Roshi's work.

These genius strokes are from 21-year-old black Brooklyn native Jean-Michel Basquiat, one of America's most charismatic painters and one of today's best-selling painters.

Born in 1960 to a Haitian father and a Puerto Rican mother, Basquiat spent his childhood in Boerum Hill doing art and pranks.

He never attended art school, but learned by walking through New York galleries and listening to the music his father used to play at home.

Taking inspiration from unexpected places, he scribbled his own cartoons, comic books, and Bible scenes on scrap paper from his father's office.

But perhaps the greatest influence on Basquiat was the medical encyclopedia.

When young Jan-Michael was hit by a car, his mother brought the book "Grey's Anatomy" to his hospital bed.

It ignited a lifelong fascination with anatomy that manifested itself in the skulls, tendons, and viscera of his later work, which frequently explored both the strength and vulnerability of the marginalized body.

By the age of 17, he made his first forays into the art world with his friend Al Diaz.

They spray-painted cryptic statements and symbols all over Lower Manhattan and signed with the cryptic nickname of SAMO.

These humorous, profound and rebellious declarations were strategically sprinkled throughout SoHo's art scene.

And after revealing himself as an artist, Basquiat used the success of SAMO to enter the scene himself. They sold postcards, played clubs with avant-garde bands, and boldly sought out heroes.

By the age of 21, he was painting full-time.

His process was a kind of calculated improvisation.

Like beat writers who constructed their work by shredding and recomposing sentence fragments, Basquiat used a similar cut-up technique to remix material.

When he couldn't afford canvas, he made it from discarded wood he found on the street.

He used oil sticks, crayons, spray paint, and pencils, drawing from menus, comic books, and textbooks he kept open on his studio floor.

He kept these sources open on the studio floor, often working on multiple projects at once.

Incorporating fragments of anatomy, reimagined historical scenes, and skulls transplanted from classic still lifes, Basquiat repurposed both contemporary experience and art history into an original visual language.

Working as if to insert himself into the borrowed artist's legacy, he produced collages that interacted with art history as much as they interacted with each other.

For example, "Toussaint's Overture vs. Savonarola" and "The Unknown Genius of the Mississippi Delta" offer two different visions of Basquiat's historical and contemporary interests.

However, details such as the head that reappears in "PPCD" resonate with each other.

All these works form a network that provides physical evidence of Basquiat's restless and prolific spirit.

These chaotic canvases quickly gained admiration and attention.

But despite increasingly mainstream audiences, Basquiat persisted in portraying the challenging themes of identity and oppression.

Prisoners, cooks, janitors and other marginalized people take center stage.

His obsession with the body, history and representation can be found in works that evoke the Atlantic slave trade and African history, as well as focusing on contemporary race relations.

In less than ten years, Basquiat produced thousands of paintings and drawings, along with sculptures, poetry fragments and music.

His work accelerated with a meteoric rise to fame, but his life and work were tragically cut short when he died of a drug overdose at the age of 27.

After his death, the value of Basquiat's work only increased, but the energy and flair of his work had a greater impact than its monetary value.

Today, his influence swirls all around us in music, poetry, fashion, film, and more, and his art retains the power to shock, inspire, and resonate with us.

This syringe contains a radioactive form of glucose known as FDG.

Doctors will soon inject the contents into the patient's arm, and she is using a PET scanner to check for cancer.

FDG circles his body rapidly.

If he has a tumor, the cancer cells in it will make up a significant portion of the FDG, which will act as a beacon for the scanner.

PET tracers such as FDG are one of the most exciting tools in medical diagnostics and their lifetime begins just hours ago in particle accelerators.

The particle accelerators in question are called cyclotrons and are often kept in bunkers within hospitals.

It uses an electromagnetic field to propel charged particles like protons faster and faster along spiral paths.

When the protons reach maximum velocity, they are fired at a target containing a few milliliters of water containing heavy oxygen called oxygen-18.

When a proton hits one of these heavier oxygen atoms, it kicks out another subatomic particle called a neutron.

This bombardment converts oxygen-18 to fluorine-18. Fluorine-18 is a radioactive isotope that can be detected on PET scans.

Within just under two hours, about half of the fluorine has been lost to radioactive decay, giving the scan time to complete.

So how can fluorine-18 be used to detect disease?

Hospital radiochemists use a series of chemical reactions to attach radioactive fluorine to different molecules to create radiotracers.

The identity of the tracer depends on what the doctor wants to observe.

FDG is common because the rate at which cells consume glucose can indicate the presence of cancer. site of infection. Or a decline in brain function due to dementia.

The FDG is now ready to scan the patient.

Once a radiolabeled tracer enters the body, it travels through the circulatory system and is taken up by targets such as proteins and cancer cells in the brain.

Within minutes, a significant amount of tracer reaches the target area and the rest is cleared from circulation.

Doctors can now view objects using PET (Positron Emission Tomography) scanners.

What makes this possible is the radiation emitted by the tracer.

The isotopes used in PET decay by positron emission.

A positron is essentially an electron with a positive charge.

When a positron is emitted, it collides with an electron from another molecule around it.

This converts the mass of the two particles into two high-energy photons resembling X-rays, causing a small nuclear reaction that fires in opposite directions.

These photons hit a pair of arrays of radiation detectors in the walls of the scanner.

The scanner's software uses these detectors to estimate where in the body the impact occurred and create a 3D map of the tracer's distribution.

PET scans can detect the spread of cancer before other types of imaging detect it.

They are also revolutionizing the diagnosis of Alzheimer's disease by allowing doctors to see amyloid, a telltale protein build-up that could only be seen at an autopsy.

Meanwhile, researchers are actively working to develop new tracers and expand the potential applications of PET scanning.

But with all the talk about radiation and nuclear reactions in the body, are these scans safe?

Although no amount of ionizing radiation is completely safe, the amount of radiation the body receives during a PET scan is actually very small.

A single scan is equivalent to exposure over a period of 2-3 years from natural radiation sources such as radon gas. Or how much cosmic radiation a pilot receives after 20-30 transatlantic flights.

Most patients find these risks tolerable in order to have the opportunity to diagnose and treat their disease.

In the 13th century, Genghis Khan embarked on a mission to conquer Eurasia, quickly conquering nations and drawing them into the expanding Mongol Empire.

Its vast army made him almost unstoppable.

However, according to legend, there was one obstacle that even the great Khan could not overcome. It is a towering ice wall built over the mountain pass by the locals to prevent the Khan's army from encroaching on their territory.

No one knows how historically accurate that particular story is, but surprisingly, it's based on fact. For centuries, in the Karakorum and Himalayas, people have grown glaciers and used these homemade ice blocks as a source of drinking water and irrigation for crops.

But before getting into that fascinating phenomenon, it's important to understand the difference between wild-growing glaciers and man-made glaciers.

In the wild, glaciers require three conditions to grow: snowfall, cold temperatures, and time.

First, it snows a lot.

After that, colder temperatures allow the snow to fall and persist throughout winter, spring, summer and fall.

Over the next few years, decades, and hundreds of years, the pressure of accumulated snow transforms the layer into highly compacted glacial ice.

But growing glaciers artificially is quite different.

For centuries, some local cultures have believed that glaciers live at the confluence of three great mountain ranges: the Himalayas, the Karakorum and the Hindu Kush.

Additionally, a given glacier may have different genders, including males and females.

Local glacier growers "breed" new glaciers by grafting (or mating) ice fragments from male and female glaciers and covering them with charcoal, wheat skins, cloth, or willow branches so they can reproduce.

These glaciers transform into fully active glaciers under a protective membrane, with more snowfall each year leading to glacier growth.

They act as a permanent reservoir of water that farmers can use to irrigate their crops.

These practices have spread to other cultures, with people creating their own versions of glaciers and applying them to solve some of the most acute challenges of modern water supply.

Take Ladakh, a high desert region in northern India, for example.

Located in the rain shadow of the Himalayas, the average annual rainfall is less than 10 centimeters.

As climate change shrinks local glaciers, water shortages in the region are exacerbated.

So locals started growing glaciers themselves as insurance against this uncertainty.

These glaciers are of two types: horizontal and vertical glaciers.

Horizontal glaciers are formed when farmers channel glacier meltwater into channels and pipes and carefully siphon them into a series of basins made of stone and earth.

Villagers finely control the release of water into these reservoirs, waiting for new layers to freeze before filling the basins with the next wave.

In early spring, these frozen ponds begin to melt, providing irrigation to the villagers' fields.

The locals use meltwater from glaciers that already exist above the village to create vertical glaciers.

The meltwater enters a channel that flows downhill until it reaches the farmland, where it gushes out of a pipe that points straight into the air.

As winter temperatures cool, this water arcs and freezes out of the pipes, eventually forming 50-meter-tall ice sculptures called pagodas shaped like upside-down ice cream cones.

This upside-down shape minimizes the surface area exposed to the sun in spring and summer.

This allows the mini-glaciers to melt slowly, ensuring a reliable water supply to feed the farmers' crops.

These methods may be old, but they are becoming even more important as climate change wreaks havoc on our planet.

In fact, people are now growing their own glaciers in many areas outside of Ladakh.

The Swiss created the first pagoda in the Swiss Alps in 2016 using the latest glacier-growing technology.

There are plans to set up more than 100 more facilities in villages in Pakistan, Kazakhstan and Kyrgyzstan.

Perhaps one day we will be able to take advantage of our own glaciers to build entire ice walls. This time it's not to keep people out, but to allow life in some of the harshest terrain on earth.

I have not come to you today as an expert.

I came to you as someone who is very interested in how I am improving my work and how we are all doing.

I think it really matters not just how good you are now, but how good you will be in the future.

I was visiting this birthing center in northern India.

As I observed midwives, I found myself witnessing in them just this extreme form of conflict. It's how people improve or don't improve in the face of complexity.

In areas where these women give birth, the infant mortality rate in typical midwives is 1 in 20, and the maternal mortality rate is 10 times higher than in other areas.

Now, we've known for decades the key practices that prevent the birth of mass murderers, but the fact is that even in this place, and especially in this place, the simplest things are not the simplest.

For example, I know I should wash my hands and wear clean gloves, but here the faucet is in another room and I don't have clean gloves.

In order to reuse the gloves, I wash them in a basin of this diluted bleach and I can still see the blood on them from the last delivery.

10 percent of babies are born with breathing difficulties everywhere.

we know what to do

Wipe your baby with a clean cloth to stimulate your baby's breathing.

If they don't start breathing, you suck their airway.

If that doesn't work, use a baby mask to breathe.

But these are mostly textbook-learned skills, and that baby mask is broken.

For me, this disturbing image is a striking reminder of just how dire the situation is.

This is a 10 minute old baby, alive, but only a little bit.

No clean cloths, no dryness, no skin-to-skin warming, no sterilized cord clamps.

He's an infection waiting to happen, and his temperature is dropping by the minute.

A successful birth requires a successful team.

The entire team must be skilled and coordinated. The nurses who make deliveries at these locations, the doctors who support them, the supply officers who are responsible for the inventory and bedside of 22 vital medicines and supplies, and the medical officer responsible for the overall quality of the facility.

Importantly, they are all experienced professionals.

I have not met anyone who has not participated in thousands of deliveries.

However, they seem to have reached their limits for the complexity they face.

They weren't getting better.

What really matters is how well you do it.

Let's get to the fundamental question.

How do professionals do their jobs better?

how do they become great?

And there are two views on this.

One is the traditional pedagogical view.

It means going to school, studying, practicing, learning, graduating, and then going out into society and carving out a path for yourself.

A professional is someone who can manage their own improvement.

This is the approach that virtually all professionals have learned.

That's how doctors learn, lawyers, scientists learn...

musician.

And the problem is that it works.

Consider, for example, legendary Juilliard violin teacher Dorothy DeLay.

She coached an astonishing roster of violin virtuosos, including Midori, Sarah Chan and Itzhak Perlman.

Each of them came to her as a young talent and worked with her over the years.

She said her biggest effort was instilling thinking and learning habits in her children so that when the work was done they could make their own way in a world without her.

Now, sports give rise to contrasting views.

And they say, "It's not the end, everyone needs a coach."

everyone.

The best in the world needs a coach.

Think about it from a surgeon's point of view.

I pay someone to come into my operating room to observe and criticize me.

It seems absurd.

Expertise means no coaching required.

So which view is correct?

I learned that coaching has been incorporated into sports as a very American way of thinking.

In 1875, Harvard and Yale hosted one of the first American Rules football games.

Yale hired a head coach. Harvard University was not.

result?

Over the next 30 years, Harvard won only four times.

Harvard hired a coach.

(Laughter.) And that's how the sport became.

But is it necessary then?

Will it be applied to other fields?

I decided to ask Itzhak Perlman more than anyone else.

He was trained in the manner of Dorothy DeLay and is arguably the greatest violinist of his generation.

One of the great things about writing for The New Yorker is that I call people and they call me back.

(Laughter.) And Perlman called me.

So we ended up talking for almost two hours about how he got to this point in his career.

So I asked him, "Why don't violinists have coaches?"

And he said, "I don't know, I always had a coach."

"Did you always have a coach?"

"Oh, yes, my wife Toby."

They graduated from the Juilliard School together, and she quit her job as a concert violinist to become his coach, sitting in the audience watching him and giving him feedback.

"Itzhak, you can see that the middle part sounded a little mechanical.

What will be different next time? ”

He said it was crucial to all he grew up with.

I found that there are various problems in making it by self-study.

You may not be aware of the blocking problem, or even if you are aware of it, you may not necessarily know how to solve it.

As a result, improvement stops along the way.

And when I thought about it, I realized that's exactly what happened to me as a surgeon.

I started practicing in 2003 and for the first few years the learning curve was steadily upward.

I have observed a decline in the incidence of complications from year to year.

And after about five years it leveled off.

And after a few more years, I realized that I wasn't getting better.

And I thought, "Is this enough?"

So I thought about it a little more and said...

"Okay, I'll try the coach."

So I asked a former professor who retired. His name is Bob Osteen and he agreed to come and observe me in the operating room.

That incident -- I remember the first incident.

It went great.

I didn't think he had to say anything after we finished.

Instead, notes were written all over the page.

(Laughter) "It's just a small thing," he said.

(laughs) But it's the little things that count.

"Did you notice the light coming out of the wound during the incident?

I spent about 30 minutes just trying to turn off the light from the reflective surfaces. ”

"There's one more thing I've noticed," he said, "sometimes my elbow goes up in the air.

This means that you are not in complete control.

The surgeon should rest comfortably with the elbows at their sides.

This means that if you feel your elbow is floating, you need to use a different device or just move your foot. ”

It was a whole other level of consciousness.

And I couldn't help but think there was something fundamentally deeper about this.

He explained what good coaches do. They are your outer eyes and ears, giving you a more accurate picture of your reality.

they know the basics.

They help you take your action apart and put it back together.

After two months of coaching, I felt myself getting better again.

And a year later, complications were even less.

It hurt.

There were times when I didn't want to work on anything because I didn't want to be observed.

I also felt that there was a time when things got worse before they got better.

But I realized that the coaches were thinking about something very important.

In my other work, I lead the Center for Health Systems Innovation called Ariadne Lab, which addresses health care delivery issues, including births worldwide.

As part of that, we worked with the World Health Organization to develop a safe birth checklist.

I will explain the basics.

It analyzes the basics of the critical actions the team needs to take when a woman comes into labor, when she is ready to strain, when her baby is out, and when the mother and baby are ready to come home.

And we knew that just distributing a checklist wouldn't make much of a difference, and that teaching it in the classroom wasn't always enough to bring people the changes they needed to make it happen.

And I remembered my experience and said, "Why don't you try coaching?"

What if we tried coaching at scale?”

We found great partners, including the Government of India, where we conducted trials in 120 midwives.

India's largest state, Uttar Pradesh.

Half of the center was basically just a tour, while the other half received visits from coaches.

We trained this army of doctors and nurses, learned to observe care, and helped them, including administrators, develop their strengths and address their weaknesses.

For example, one of the skills I had to work on working with people, which turned out to be fundamentally important, was communication.

Have the nurse practice speaking up if the baby mask is broken, the gloves are out of stock, or they haven't washed their hands.

Then have others, including your manager, practice listening.

This small army of coaches eventually coached 400 nurses and other midwives and 100 doctors and managers.

We tracked results across 160,000 live births.

result ...

In the control group you were in, these are the groups that received no coaching, they only completed one-third of the 18 basic exercises we measured.

And most importantly, even after years of research, no improvement was seen over time.

Others received 4 months of coaching, then tapered off over 8 months, seeing coaching increase in more than two-thirds of the exercises offered.

can.

We could see an improvement in quality. And I saw that happening in every center, suggesting that coaching could be a set of ways to add value to our work.

You can imagine a whole world of jobs that could be done by millions of people all over the world.

But we're clearly at the beginning of it, as there was still some distance to go.

To achieve a significant reduction in mortality, all checklists must be put together.

But we started to see the first place we were getting there. This center was one of them as the coaching helped me learn to build on the foundations and run.

And we could see it here.

This is a 23-year-old woman who came by ambulance while giving birth to her third child.

She had her waters broken in the triage area, so they took her directly to the delivery room where she was then tested.

I've put timestamps here so you can see how quickly all this happens and how complicated it all gets.

Within four minutes, they had taken her blood pressure, measured her pulse, and even measured the baby's heart rate.

I mean, the blood pressure cuffs and fetal Doppler monitors were all there, and the nurses knew how to use them.

The team was proficient and well-coordinated.

The mother was in good health and the baby's heart rate was normal at 143.

Eight minutes later, as the contractions increased in intensity, the nurses washed her hands, put on clean gloves, and examined her, revealing that her cervix was fully open.

Baby was ready to come.

She then went straight to do the next check.

She inspected all the equipment herself to make sure the bedside had everything she needed.

Baby masks, sterile towels and the necessary sterile equipment were there.

And after 3 minutes, one push and the baby came out.

(Applause) As I was watching this stream, I suddenly noticed that the atmosphere had changed.

The nurse saw a local health worker who came in with the woman as the baby didn't seem to be alive.

She was pale and limp and not breathing.

She will be one of those 1 in 20.

But the nurse continued the checkpoint.

She wiped the baby with a clean towel.

And a minute later, when it stopped irritating the baby, she ran to get the baby mask and the other one went to suck.

Since we were relying on electricity, mechanical suction was not possible, so we used mouth suction and were able to clear the girl's airway within 20 seconds.

Then she regained a thick green liquid, and within a minute of its formation and repeated sucking, the baby began to breathe.

(Applause.) After another minute, the baby started crying.

And five minutes later, her chest was pink and warm, and she reached out and grabbed the nurse's hand so we could all breathe.

I've seen teams change because of coaching.

And I've seen at least one life saved because of it.

A few months later, we followed up with the mother.

Both mom and baby were fine.

The baby's name is Ansika.

It means "beautiful".

And she's what's possible when we really understand how people get better at what they do.

thank you.

(applause)

Cyndi Stivers: Now about the future of storytelling.

Before we talk about the future, let's talk about what will never change when it comes to storytelling.

Shonda Rhimes: Things that never change.

Obviously, I think a good story never changes. The idea is that people need to come together and exchange their stories, talk about things that feel universal, that we all feel a compelling need to see stories, tell stories, share stories. It's like getting together around a campfire and discussing things that tell each of us that we are not alone in the world.

For me they will never change.

The essence of storytelling never changes.

CS: Okay. In preparation for this conversation, I reached out to Susan Lyne, who ran ABC Entertainment when you were working on "Grey's Anatomy" -- SR: Yes.

CS: And she said she had an indelible memory of your casting process. There, without discussing it with any of the executives, I gathered people who came to read the script, and they were all at their best, and you said you didn't type anyone in, which was a complete surprise.

So she said, in addition to retraining studio executives, she feels you're also retraining the expectations of American television audiences, and I think so, so do I.

So what else is your audience needing that you haven't yet realized?

SR: What else have we not noticed yet?

Well, I mean, I don't think we're even close to that yet.

I mean, we're still far behind what the real world actually looks like.

We didn't bring in a bunch of actors who looked very different from each other just because we wanted to make a point, and we weren't trying to do anything special.

I had no idea it was new, different, or strange.

I brought in the actors because I thought they were funny, and to me the idea that it's totally amazing to everyone, I haven't known it for a while.

What I thought was, these are the actors I want to see play.

I would love to see what happens when I read it.

Let's see what happens.

So I think what's interesting is that looking at the world through a different lens allows you to see things differently when you're not the person who's usually in charge of things.

CS: So you're running this big machine as a giant right now -- you know, when she gave a talk last year, she was a giant.

So what do you think will happen if we continue like this?

Huge amounts of money are involved in the production of these shows.

The tools for making stories have been discontinued and heavily democratized, but there is still a large distribution of people renting networks, renting viewers to advertisers, and paying for everything.

How do you think business models will change now that anyone can be a storyteller?

SR: I think it's changing day by day.

So the rapid changes that are happening right now are amazing.

And I don't mean it in a bad way, although I feel the panic is evident.

I think it's kind of exciting.

The idea that there's some kind of equalizer going on, that anyone can make something, is great.

I think there's a kind of fear in the idea that good work can't be found now.

There is a lot of work out there.

I think there are 417 dramas on TV now, anytime, anywhere, but I can't find them.

I can't find any good ones.

There are so many bad things out there because anyone can make something.

It's as if everyone was drawing a picture.

Not many people are good painters.

But it's getting harder and harder to find good stories and good shows.

Because if you have one little show on this AMC and one little show on this AMC, it's going to be much harder to find where they are.

So to hunt down the gem and find out who made the awesome web video and who made this, I mean, think of those poor critics now stuck at home and spending 24 hours a day watching everything.

It's not an easy task now.

So while distribution engines are getting bigger and bigger, it's getting harder and harder to find good shows for everyone.

And unlike news where everything is sorted out just who you are, TV, which refers to anything you can watch, TV shows, seems to be getting wider and wider.

And everyone is making up stories, and sometimes geniuses are hiding.

But it will become even harder to find, and at some point it will fall apart.

People keep talking about TV peaking.

I don't know when that will happen.

I think at some point it crumbles a bit and we kind of get back together.

I don't know if it will be network TV.

I don't know if that model is sustainable.

CS: What about the models that Amazon and Netflix are currently investing heavily in?

SR: That's true.

I think it's an interesting model.

I think there is something exciting.

I think there is something exciting about it for content creators.

I think there is something exciting for the world.

The idea of ​​having a multilingual program with characters from all over the world that is engaging yet accessible to everyone at the same time is very exciting.

So it makes sense to me that television can now have an international feel and programming can now.

Television, for example, is made for an American audience.

We make these shows and they push it out into the world and hope for the best, as opposed to getting serious about the fact that America isn't.

I mean, we love ourselves and everything, but it's not me.

And when you tell a story, you have to take into account the fact that there are many other places in the world that you want people to be interested in.

It makes the world smaller.

don't know.

I think it drives the idea that the world is a universal place and that our stories are going to be universal.

We stop being other.

CS: As far as I know, you've also pioneered interesting ways to launch new shows.

So when you announced "Scandal" in 2012, there was an astonishing wave of support on Twitter that no one had ever seen before.

Is there anything else you're working on for the next release?

What do you think about that?

SR: I have some interesting ideas.

A program called "Still Star-Crossed" will be broadcast this summer.

I have some interesting ideas for that.

I don't know if I will make it in time.

I thought they had fun.

But the idea of ​​live-tweeting our show really just thought we sounded interesting.

We didn't know the critics would start live-tweeting with us.

But fans make it kind of like a campfire by getting people involved, and when you're all on Twitter together and talking together, it's a more shared experience, so it's important to find other ways to make that possible, find other ways to make people feel involved.

CS: So how do you think storytellers get paid when different people are creating stories and only some of them break out and somehow gain an audience?

SR: Actually, I also struggled with this concept.

Will it be a subscription model?

Will people say I'm going to watch this particular person's show and that's what we're going to do?

CS: I think you should buy a passport to Shondaland. right?

SR: I don't know about that, but yeah. It's even harder for me.

I'm sure there are different ways, but I'm not always sure.

Let's be honest, many content creators aren't necessarily interested in becoming a distributor. Mainly because what I dream about is creating content.

I really love creating content.

I want the money for it, and I want the amount it deserves, but it's kind of hard to find.

But I also want the people who work with me, the people who work for me, everyone to be paid in some way so that they can all make a living.

How to distribute it is becoming more and more difficult.

CS: What about many new tools like VR, AR...

I think it's fascinating that you can't watch them all at once or fast-forward.

What do you think the future holds for storytelling?

SR: I spent a lot of time exploring them last year, getting a lot of demonstrations and paying attention to them.

I find them attractive mainly for the following reasons. I think most people are thinking about games, I think most people are thinking about action or something like that. And I think there's a very intimate feeling about those things. I mean, imagine this. You can sit there and have a conversation with Fitz. At least it's very heartfelt while Fitz sits there talking to President Fitzgerald Grant III and tells you about why President Fitzgerald Grant III makes the choices he makes. It's a moment.

And instead of you looking at a TV screen, you're sitting next to him and he's having this conversation.

Well, you fall in love while watching the man from your TV screen.

Imagine sitting next to him or with a character like Huck trying to execute someone.

And instead of a scene where he talks very quickly to another character, he goes into the closet and turns to you to tell you what's about to happen and why he's scared and nervous.

It's a bit more like theater and I don't know if it will work, but I'm interested in the concept of something like that and what it means for the audience.

And it would be interesting to try those ideas, and I think there's something interesting in there for my audience, the people who watch my show, women aged 12 to 75.

CS: So what's the feedback from the audience?

How interested are you in something where the audience can actually get to a certain point and then decide, "Oh wait, I'm going to choose my own adventure."

Run away with Fitz, or -- SR: Oh, a story of choosing your own adventures.

I'm not good at these things, not necessarily because I want to control everything, but because I know for a fact that when you're watching TV or a movie and you can control exactly what happens to other people's characters, the stories aren't that good.

It would be nice if Walter White could say exactly what he wanted to happen, but the story isn't the same and it's not as strong.

If I was in charge of how The Sopranos ended, that would be great, and it would be a satisfying ending. But it's not the same story, it's not the same emotional impact.

CS: I can't help but imagine what it is.

Sorry, I'm a little lost.

SR: But the wonderful thing is that I can't imagine it. Because Vince has his own ending, and knowing someone else told it is really powerful.

Even if you could decide in Jaws that the shark wins or something, the shark won't do what you need it to do for you.

Stories are stories told, and you can walk away angry, you can stop arguing and walk away, you can walk away arguing, and that's why it works.

That's why it's art.

Otherwise it's just a game, and games can be art, but in very different ways.

CS: Gamers selling the right to actually sit there and comment on what's going on, to me it's more community than storytelling.

SR: That's the campfire's unique format.

I don't mean to dismiss it as a form of storytelling, but I think it's a group format.

CS: Okay. What about supersuper? Everything is getting shorter and shorter.

And as you know, Snapchat has something called one-minute shows.

SR: Interesting.

Part of my mind thinks it sounds like a commercial.

So it's like having a sponsor.

But there are parts of me that I completely understand.

There are really great ones.

When you think about a world where most people watch TV on their cell phones, or places like India where most of the input comes in and most of the product comes from there, shorter makes more sense.

Some distributors have figured out how to make more money if they can charge more for short-term content.

If you're creating content, it costs less to create and publish.

By the way, if, like my daughter, you're 14 and don't have attention spans, that's what you want to see, what you want to make, and it works.

And if it's done right and really feels like a story, people will stick to it no matter what you do.

CS: I'm glad you raised your daughters. Because I wonder how my daughters will consume entertainment, and news as well as entertainment.

When they don't, that is, the algorithmic robot lords are going to give them what they've already done.

How do you think we can fix that and make people a balanced nation?

SR: Well, myself and the way I fix it is very different from how other people fix it.

CS: Feel free to guess.

SR: I really don't know what to do in the future.

So all my poor children were the subject of my experiments.

We are still doing what I call "Amish Summer." There, I turn off all electronics, put away my computers and everything else, and watch them scream for a while until we settle into an electronics-free summer.

But let's be honest, it's a very tough world right now. As adults, we are so interested in seeing ourselves that sometimes we don't even realize that we are being given only our opinion.

The way it works now, you're looking at a feed, and as it's being revised, you're getting only your opinion and feeling more and more right about yourself.

So how do we actually identify it?

I'm getting a little worried.

So maybe it gets overcorrected, maybe it all explodes, or maybe we all end up -- I hate to be negative about it, but maybe we're all getting stupider.

(Cindy laughs) CS: Well, can you think of any modifications you could make to a scripted fictional piece?

SR: I often think about the fact that television has the power to educate people in powerful ways. While watching television, research is conducted on, for example, medical programs.

87 percent, I think. Eighty-seven percent of people get most of their knowledge about medicine and medical facts from medical programs, far more from doctors than from articles.

That's why we strive so hard to be accurate and every time we make a mistake we feel really guilty that we're doing something wrong, but at the same time we provide a lot of great medical information.

There are many other ways to provide information about those shows.

People may not want to read the news because they are having fun, but the show has many ways of providing fair information. It tells the truth in a very interesting and intelligent way, not in a creepy way to control people's minds, and not in a way that forces one version over the other.

But it would be strange if TV dramas were a vehicle for news.

CS: Weird, but fiction became prophecy this season, so I've collected a lot of your writings, haven't I?

SR: You know, 'Scandal' was very disturbing for that reason.

We have this show about crazy politics, and it's basically how we've always been on the show -- you know, everybody's looking at the newspapers.

we read everything. we talk about everything.

I have many friends in Washington.

And we were always doing the show as a guess.

We sat in our room wondering what would happen if the wheels on the bus came off and everything went wrong.

It was always great, but now it felt like things were really going crazy with the wheels off the bus, so what we had guessed really became a reality.

I mean, our season this year was going to end with the Russians dominating the American election, and we wrote it, planned it, and it was all there, but suddenly the Russians were suspected of being involved in the American election and we had to change what we were going to do in the season.

I went inside and thought, "That scene where the mysterious woman starts speaking Russian?"

We have to fix it and figure out what to do. ”

It's just extrapolating from what we thought would happen or what we thought was crazy.

CS: That sounds great.

So are you looking for the United States or anywhere else in the world?

Who is doing interesting storytelling right now?

SR: I don't know, but there are a lot of interesting things out there.

Obviously British TV is always great and always doing interesting things.

I'm busy with work, so I can't watch TV much.

And I try not to watch much TV, even American TV, until the season is over.

We begin to wonder why our characters can't wear crowns or talk about thrones.

It gets crazy.

So I try not to watch too much until the season is over.

But I think there is a lot of interesting TV in Europe.

I attended the International Emmy Awards and looked around and saw what was being shown and was kind of fascinated.

There are a few things I want to see and check.

CS: Can you imagine -- I know you don't spend a lot of time thinking about technology, but did you know that a few years ago someone here at TED was talking about looking at Google Glass, wearing Google Glass, and basically seeing TV shows in your eyes?

Have you ever imagined a little girl sitting on the floor of your family's pantry? Have you ever imagined other mediums?

Or do you want to do it now?

SR: Other Medium.

For storytelling outside of books?

I mean, I grew up wanting to be Toni Morrison, so no.

I didn't even think of television.

The idea is that there is a bigger world and a more magical way of making things. I'm always excited when new technology comes out and I'm always the one who wants to try it.

The possibilities are endless and exciting right now, and that excites me.

I really feel like I'm in the Old West right now. Because no one knows what we will decide.

Now I can put stories anywhere and that's great for me. The possibilities feel endless when you find a way to reconcile technology and storytelling creativity.

CS: Also, technology has made it possible for us to do that kind of binge-watching, which I mentioned a little bit earlier, but that's a recent phenomenon since you've been doing shows, right?

And how do you think it will change the storytelling process?

You always had the bible for the entire season beforehand, right?

SR: No, we always knew where we would end up.

So, for me, the only way I can really comment on that is that I have a show that's been on for 14 seasons, so I have people that have been watching it for 14 seasons, and I have 12 year old girls that I met at the supermarket who watched 297 episodes in 3 weeks.

Seriously, it's a very different experience for them. Because they are very focused on something in a very intense way for a very short period of time. And for them, the story has a completely different arc and a completely different meaning.

CS: It's like visiting a country and then leaving. It's weird -- SR: It's like reading a great novel and forgetting about it.

I think that's the beauty of this experience.

You don't necessarily have to watch anything for 14 seasons.

Not necessarily everything should be this way.

CS: Are there any topics that you feel shouldn't be touched on?

SR: I don't think I think of stories that way.

I think of the story in terms of the characters, what they do, what they need to do to move forward. So we never think of the story in terms of plot alone. When a writer comes into my writer's room and pitches me a plot, I say, "You don't speak English."

that's what i say.

we don't speak english I need to hear the truth.

And I don't think so.

I don't know if there's a way to think that there are things I don't do. Because it feels like you're ripping part of the plot off a wall or something.

CS: That sounds great. To what extent do you expect it to be used -- As you may know, you recently became a board member of the Planned Parenthood Association and campaigned for Hillary Clinton.

To what extent do you see yourself using your storytelling in the real world to effect change?

SR: Well, it's a very important subject for me. Because I find the lack of story that many find difficult.

As you know, there are many organizations that have not created positive stories themselves that work for them.

There are many campaigns that can help bring better stories to life.

Democrats have a very strong narrative for themselves and can do a lot.

A lot can happen when it comes to the use of storytelling voice, but this is not in the fictional sense, but in the same sense as intended by the speechwriter.

I understand that, but I'm not necessarily sure it's my job.

CS: Okay.

Please help me appreciate Shonda. SR: Thank you.

(applause)

So, in fact, I've spent my life researching the lives of our now-deceased presidents.

I think of Abraham Lincoln in the morning and Franklin Roosevelt when I go to bed at night.

But when I try to think about what I learned about the meaning of life, my mind goes back to a seminar I took with the great psychologist Eric Erickson when I was a graduate student at Harvard.

He taught me that the richest and most fulfilling lives are those that seek to achieve an inner balance between the three realms of work, love and play.

And to pursue one realm in disregard for the other exposes oneself to the ultimate grief in old age.

Pursuing all three with the same dedication allows for a life of not only achievement but also peace.

So, since I'm telling the story, let's look back at the lives of two presidents I've studied to illustrate this point: Abraham Lincoln and Lyndon Johnson.

As for the first field of work, I think what the life of Abraham Lincoln suggests is that fierce ambition is a good thing.

He had big ambitions.

But it wasn't just for status or power, celebrity or fame. The goal was to achieve something worthwhile in life to make the world you lived in a little better place.

Lincoln seems to have had heroic dreams since childhood.

Somehow he had to escape the harsh farm where he was born.

No schooling was possible for him except to spend a few weeks here and a few weeks there.

But in his spare time he read.

He is said to have been so excited he could not sleep when he obtained the King James Bible and Aesop's Fables.

he couldn't eat

The great poet Emily Dickinson once said, "No frigate can take our land like a book."

How true for Lincoln!

He never intended to travel to Europe, but he entertained England with Shakespeare's kings, and went to Spain and Portugal with Lord Byron's poetry.

Literature allowed him to transcend his surroundings.

However, there were too many losses in his childhood that made him haunted by death.

His mother died when he was only 9 years old. His only sister Sarah gave birth a few years later. And my first love, Anne Rutledge, when I was 22.

Moreover, his mother, as she lay dying, gave him no hope that they would meet in the afterlife.

She just said to him, "Abraham, I am leaving you now, and I will never return."

As a result, he became obsessed with the idea that when humans die, our lives are swept from dust to dust.

But it wasn't until he grew up that he took some solace from the ancient Greek concept (which has been followed by other cultures as well) that if he could achieve something worthwhile in his life, he could live on in the memories of others.

Your honor and reputation will outlast you on earth.

And that worthy ambition became his guidepost.

As a result, he experienced severe depression only once in his early thirties.

Three things happened to make him depressed.

He had broken off his engagement to Mary Todd, and though he wasn't sure he was ready to marry her, he knew how shocking it would have been for her to do so.

His only close friend, Joshua Speed, was due to leave Illinois and return to Kentucky because his father died.

And his political career in the state legislature went downhill.

He was so depressed that his friends worried he might kill himself.

They took away all the knives, razors and scissors from his room.

Then his great friend Speed ​​went to his side and said, "Lincoln, you must stand up or you will die."

"I'm going to die any minute now, but I haven't done anything yet to remind humans that I was alive," he said.

Driven by that ambition, he returned to the legislature.

He eventually won a seat in parliament.

After that, he ran twice for the Senate, but was unsuccessful twice.

Ernest Hemingway once said: "Everyone gets hurt in life. But some people are stronger where they get hurt."

There he stunned the nation with an upset victory for the presidency over three far more experienced, far more educated, and far better-known rivals.

And after winning the general election, he surprised the public even more by appointing each of these three rivals to a cabinet.

It was an unprecedented act at the time because everyone thought, ``That person will stand out compared to these people.''

They said, "Why are you doing this, Lincoln?"

He said, "Behold, they are the strongest and most capable men in this country.

The country is in danger. I want them by my side. ”

But perhaps my old friend Lyndon Johnson said this in a less noble way. "It is better for the enemy to urinate inside the tent than for him to urinate outside the tent."

(Laughter) But it soon became clear that Abraham Lincoln would emerge as the undisputed captain of this unruly team.

For they soon came to realize that he possessed an unparalleled set of emotional strength and political skills, which proved far more important than the thinness of his external résumé.

First, he had an uncanny ability to empathize and consider other people's points of view.

He repaired hurt feelings that might have escalated into lasting animosity.

He easily shared his achievements, took responsibility for the failures of his subordinates, and always admitted his mistakes and learned from them.

These are the qualities we should be looking for in a 2008 candidate.

(Applause.) He refused to be triggered by petty complaints.

He never succumbed to jealousy or brooded over what seemed disrespected.

And he expressed his unwavering convictions in everyday words, metaphors, and stories.

And with the beauty of words, it was as if Shakespeare and the poetry he loved as a child penetrated his very soul.

In 1863, when the Emancipation Proclamation was signed, he brought his old friend Joshua Speed ​​back to the White House, recalling a very sad conversation decades ago.

And pointing to the proclamation, he said, "I believe that this measure will fulfill my most earnest wish."

But when he tried to sign the proclamation, his own hands were numb and trembling. Because he shook hands with a thousand people at the New Year's reception that morning.

So he put down his pen.

He said, "If my soul is in action, it is in this action.

But if I sign with a trembling hand, posterity will say, 'He hesitated.

But Lincoln, however dreamy he was, could not have imagined the extent of his reputation.

I was very excited to find an interview with the great Russian writer Leo Tolstoy in a New York newspaper in the early 1900s.

In it Tolstoy told of a recent trip to a very remote region of the Caucasus. There were only wild barbarians who had never left this part of Russia.

Knowing that Tolstoy was among them, they asked him to tell the story of a great man in history.

So he said, "I told them about Napoleon, Alexander the Great, Frederick the Great, Julius Caesar, and they liked it very much.

But before I had finished speaking, the chief of the barbarians stood up and said, "But wait, you have not told us about the greatest ruler of them all."

We want to hear about the man who spoke like thunder, laughed like the sunrise, and came from a place called America, far from here. If young people travel there, they will be old people when they arrive.

Please tell me about that man. Tell me about Abraham Lincoln,' he wondered.

He told them all he could about Lincoln.

And in an interview he said, "What made Lincoln so great?

Not a great general like Napoleon, not a great statesman like Frederick the Great. ”

Historians, however, would almost agree that his greatness lay in the honesty of his character and the moral fiber of his being.

Thus finally came true the powerful ambitions that drove Lincoln through a dark childhood.

It was that ambition that allowed him to struggle to be self-educated and to experience a series of political failures and the darkest days of the war.

his story will be told.

So when it comes to that second sphere, which is not work, but love, which includes family, friends and colleagues, it also requires effort and dedication.

Lyndon Johnson's later years, which I saw when I helped write his memoir, spent years in pursuit of work, power, and personal success, leaving him with no mental or emotional resources to navigate the days after the presidency.

My relationship with him started on a rather bizarre level.

I was elected a White House Fellow when I was 24.

We had a big dance at the White House.

President Johnson danced with me that night.

It's not that special. Only three of the 16 White House Fellows were women.

But he whispered in my ear that he wanted me to work directly in the White House.

However, things were not so simple.

For in the months leading up to my election, like many young people, I was active in the anti-Vietnam war movement, writing an article against Lyndon Johnson that unfortunately appeared in The New Republic two days after the White House dance.

(Laughter) And the topic of the article was how to remove Lyndon Johnson from power.

(Laughter.) So I was pretty sure he would kick me out of the program.

But to my surprise, instead, he said, "Oh, take her here for a year, and if I can't convince her, no one can convince her."

So I ended up working for him at the White House.

I ended up accompanying him to his ranch to help write his memoir, but I never fully understood why he had chosen me to spend so much time with him.

I'd like to believe it was because I was a good listener.

he was a great storyteller.

A wonderful, colorful, anecdotal story.

But there's a problem with these stories, and as it turned out, half of them weren't true.

But still they were great.

(Laughter) So I think part of what made him so appealing to me was that I loved listening to his lofty stories.

But it also bothered me that I was a young woman at the time.

And he had a reputation as something of a minor league womanizer.

So even when I didn't have one, I was always talking to him about boyfriends.

Everything was going perfectly, but one day he wanted to discuss our relationship.

It sounded very eerie when he took me near a lake conveniently called Lake Lyndon Baines Johnson.

And wine and cheese, and red-checked tablecloths, all were romantic adornments.

And he began, "Doris, better than any woman I've ever known..." and my heart sank.

And he said, "I remember my mother when I see you."

(Laughter) It was pretty embarrassing considering what was going on in my mind.

But I have to say that the older I get, the more I realize how wonderful a privilege it was to spend so much time with this old lion male.

Winner of a Thousand Contests, Three Major Civil Rights Acts, Medicare, and Education Assistance.

However, it was ultimately defeated in the Vietnam War.

And he was so sad and so vulnerable that he opened up to me in ways I never would have known had I known at the height of his power, to share his fears, sorrows and worries.

And I'd like to believe that that privilege sparked in me a drive to understand the inner man behind public figures, which I've been trying to bring into each of my books ever since.

But it also reminded us of the lesson Eric Ericson tried to instill in all of us about the importance of finding balance in life.

For Lyndon Johnson ostensibly had all the goodness in the world for the last few years in the sense that he was elected president. He had all the money he needed to do his favorite leisure activities. He owned a spacious ranch in the countryside, a penthouse in the city, and yachts and speedboats.

He had servants who answered his every whim, and a family who loved him dearly.

Nevertheless, after years of focusing solely on work and personal success, he could not find solace in family, recreation, sports or hobbies after retirement.

It was as if the hole in his heart was so large that even the love of his family could not fill it without a job.

As his spirit declined, his body deteriorated, and I believe he finally brought his own death slowly.

Over the years, he said, he was very sad to see the American people turn to the new president and forget him.

With immense sorrow in his voice, he said he should have spent more time with his children and their children.

But it was too late.

For all that power, all that wealth, he was alone when he finally died - his ultimate fear realized.

So that third area of ​​play, which he never learned to enjoy, I learned over the years that even this area needs time and energy to be invested in. Enough time and energy to allow hobbies, sports, love of music, art, literature or any form of recreation to provide true pleasure, relaxation and replenishment.

For example, Abraham Lincoln's love of Shakespeare was so deep that even in the dark days of the war he made time to spend more than 100 nights in the theater.

As the lights dimmed and the Shakespearean play began, he said he could imagine himself stepping back in time to Prince Hal for a few precious hours.

But an even more important form of relaxation for him, something Lyndon Johnson never got to enjoy, was somehow a love of humor and a sense of what the jolly part of life creates as a sidetrack of grief.

He once said that he laughed so as not to cry, that a good story is better for him than a drop of whiskey.

His storytelling powers were first recognized when he was on the Illinois circuit.

Lawyers and judges traveled from county court to county court, and when anyone knew Lincoln was in town, they traveled miles to hear him.

He stood with his back to the fire and entertained the crowd for hours with his twisty tales.

And all these stories became part of his memory bank, ready to be recalled whenever needed.

And they are nothing like what we would expect from our marble monuments.

For example, one of his favorite stories was about Revolutionary War hero Ethan Allen.

And as Lincoln said, Mr. Allen went to England after the war.

And since the British people were still reeling from losing the revolution, they decided to embarrass General Washington a little by placing a giant photograph of him in the only outhouse he would encounter.

They figured he would be offended by George Washington's humiliation at the villa.

However, he came out of the warehouse completely unperturbed.

So they said, "So did you see George Washington there?"

"Oh yes," he said. "It's just the right place for him."

"What do you mean?" they said.

"Yes," he said. "Nothing excites the British more than the sight of General George Washington."

(Laughter) (Applause) As you can imagine, if you're in the middle of a tense cabinet meeting, and he's had hundreds of these talks, you need to relax.

So, between going to the theater every night and telling stories, and between his extraordinary sense of humor and his love of quoting Shakespeare and poetry, he found a form of theater to live his life.

In my own life, I will always be grateful that I found a form of play in my unreasonable love for baseball.

Thanks to that, from the beginning of spring training to the end of autumn, I have something to do besides work.

It all started when I was only 6 years old. My father taught me the mystical technique of listening to and scoring baseball games. It was so that when my father went to work in New York during the day, I could record for him the history of that afternoon's Brooklyn Dodgers game.

Now, when you were only six years old and your father came home every night to listen to you, I now found myself counting in excruciating detail every play in every inning of the game that had just been played that afternoon.

But he made me feel like I was telling him a great story.

It makes me wonder if there is something magical about history that attracts a father's attention.

In fact, I believe I learned the art of storytelling from my evening sessions with my father.

At first, I was so excited that I blurted out, "The Dodgers won!" Or "The Dodgers lost!"

That wiped out much of the drama in the last two hours.

(Laughter) So I finally learned that I had to tell the story from beginning to middle to end.

I must say that my ardent love for the Brooklyn Dodgers at the time forced me to confess to two baseball-related sins in my first confession.

The first incident happened just as I was preparing for my First Communion when Dodgers catcher Roy Campanella came to my hometown of Rockville Center in Long Island.

And I was so excited - it was my first time meeting outside of Ebbets Field.

But he happened to be speaking at a Protestant church.

If you were raised Catholic, you would think that if you walked into a Protestant church you would be beaten to death at the threshold.

So I cried and went to my father, "What are you going to do?"

He said, "Don't worry, he's speaking in the parish hall.

We are sitting in folding chairs. He talks about sportsmanship.

it is not a sin. ”

But when I left that night, I somehow convinced myself that I had traded eternal soul life for one night with Roy Campanella.

(Laughter.) And there weren't any luxuries around that I could afford.

So when I went to my first confession, I had this sin in my soul.

I immediately told the pastor.

He said, "No problem. It was not a religious ceremony."

Unfortunately, he said:

Then came my second sin.

I tried to interject things like talking too much in church, wishing others harm, and being mean to my sisters.

And he said, "Who did you wish to harm?"

And I had to say that I want various New York Yankees to break their arms, legs, and ankles so that the Brooklyn Dodgers can win their first World Series (laughs).

He said, "How often do you make such a terrible wish?"

And I had to say this in my prayers every night.

(Laughter) So he said, "Here, I'll tell you one thing.

Like you, I love the Brooklyn Dodgers, but I promise they will win fair and square one day.

You don't have to wish to harm others to make it happen. ”

“Oh yes,” I said.

Fortunately, my first confession was a baseball-loving priest.

(Laughter.) Well, my dad died suddenly of a heart attack when I was in my twenties and before we were married and had three sons, but I've passed on his memory and love of baseball to them.

But when the Dodgers abandoned us and came to Los Angeles, I lost faith in baseball until I moved to Boston and became an unfounded Red Sox fan.

And I still sometimes, when I sit with my sons with their season tickets, close my eyes to the sun and imagine myself as a young girl watching the young players on the grassy field below in front of their father: Jackie Robinson, Roy Campanella, Pee Wee Reese, and Duke Snyder.

I must say that there is magic in this moment.

When I open my eyes and see my sons where my father used to sit, I feel the unseen loyalty and affection that binds the grandfather and sons together who never had the chance to see their faces but have come to know their hearts and souls through all the stories I have told.

That's why, finally, I will always be grateful for this curious love of history that allows me to spend a lifetime looking back.

From these great men I learned about the struggle for meaning in life.

The civilians we loved and lost in our families, as Abraham Lincoln wanted to believe, and the public figures we have admired throughout history, make me believe that they can truly live on as long as we vow to tell and retell their life stories.

Thank you for allowing me to be the storyteller today.

(Applause.) Thank you.

A few years ago, about seven years ago, I found myself hiding in a festival toilet, a music festival toilet. If you've been to a music festival, yeah, you'll know by day three, it's pretty bad.

There was no toilet paper, mud everywhere and it smelled so bad that I couldn't even sit down and stood on the toilet.

And I stood there and thought, "What am I doing? I don't even need a toilet."

But the reason I went was because I was volunteering for a large charity on climate justice. That was seven years ago, at that time many people didn't believe in climate change and people were very cynical about the activism. My role, along with all my teammates, was to get people to sign petitions on climate justice and educate them a bit more on the issue.

And I was deeply concerned about climate change and the many inequalities, so I was nervous and exhausted from going and speaking to so many people. But it was because I cared, but I was exhausted and hid in the bathroom. And I didn't want my teammates to think I was slacking because they doubted my commitment to the cause.

And we would meet at the end of the shift and count the number of signed petitions, and I would often win the number of signed petitions even though I was taking a short bathroom break.

But I have always been very envious of other activists. Because they either had as much energy, or often more energy, than they had when they started the shift of getting people to sign petitions, and they were really excited to go see a band and dance in the evenings.

Even though I loved the band, I only wanted to go back to my tent and sleep because it was totally depressing and I really envy people who have the energy to go to festivals and party hard.

But it also made me very angry in my heart.

"This is unfair," I thought, "I'm an introvert and all the offline campaigns seem to favor extroverts."

I went marching and was exhausted.

Other times, I participated in campaigns held outside embassies and shops.

The only thing it offered was a very loud activity around a lot of people, always involving a lot of people and performing.

None were for introverts. And not only did I think it was unfair, but it's unfair to them because a third to half of the world's population are introverts. because we burn out. Otherwise, you will get fed up with activism and stop acting, and everyone needs to be an activist in this world.

I also didn't find it particularly clever, but I found that many of the activities that worked weren't just extroverts.

It wasn't just the noise.

It wasn't about people performing all the time.

Much of the work required was done in the background, hidden and invisible.

And because when it finally came down to being an athlete, it was the only job I could do. I was athletic in college and have been a professional campaigner for a large charity for the last ten years. And now I'm a creative campaigner consultant for various charities and other work. But I knew I needed another form of action.

About seven years ago, I started exploring what kind of quiet forms of activism I could participate in so as not to burn myself out as an activist, but also to address some of the issues I was concerned about in my campaign.

When I worked for Oxfam and other big charities, I was very lucky to read a lot of big reports about what influenced politicians, businesses and the general public, which campaigns really worked and which didn't.

And I'm a bit of a geek, so I wanted to take a look at all that stuff and think about other ways to get people involved in social change. Because if we want the world to be more beautiful, kind and fair, then our actions should also be beautiful, kind and fair. But in many cases this is not the case.

And today I want to talk about three ways I think activists need to be introverted.

I think there are many other ways, but I will only talk about three this time.

First, because activity is often very quick and intended to be done, extroverts' immediate reaction to injustice is often "I have to do it now, I have to react now." Sure you have to react, but you have to be strategic in your campaigns and simply acting on anger is often the wrong thing to do.

I use crafts such as needlework, as the man behind me does, as a way of not only slowing extroverted behavior but also engaging nervous, quiet, introverted people into the activity.

Repetitive movements such as handicrafts cannot be done quickly and must be done slowly.

And those repetitive stitches help us ponder the big, complex, and thorny issues of social change and understand what we can do as citizens, as consumers, as voters, and all those different things.

This will help you think critically while sewing and help you become more aware of what your motivations are.

Are you the Barbie doll advocate mentioned earlier?

Do you want to join people in unity or be a savior? It's often not very ethical, but

But doing needlework together with extroverts, introverts, and ambiverts, everyone is on the scale in different places, and because this is a quiet, slow form of activity, it can be very helpful to make introverts heard in other areas where they often go unheard.

It may sound strange, but you don't have to make eye contact while sewing.

So for the nervous and introverted, this means being able to step away next to someone or a group of people and ask a question that the person didn't have time to ask or was too nervous to ask when they made eye contact.

So you can get introverts who are big, deep thinkers to say, "It's very interesting that you want to do extroverted forms of activity where you're humiliating people and going out quickly. But who are you trying to target and how? Is that the best way?"

That means you can have these discussions in a very slow way. This is great for extroverts to slow down and deepen, but it's also great for introverts to feel well heard and part of the movement for change.

Some of the ways we do that is by sewing cards with what values ​​we communicate through our activities to make sure we don't just react in unethical ways.

The first is when we work with art institutions to get 150+ people at the V&A to sit for hours and discuss a particular issue, and then tweet what they think and what the outcome is, like this post.

Also, we are good at intimate activities, so we always think that activities need introverts.

So we are good at slow activities and really good at intimate ones. If this year has taught us anything, it's that when you engage with those in power, you need to listen to those you disagree with, build bridges rather than walls and walls and wars, and be critical friends rather than aggressive enemies.

And one of the things I do a lot with introverts, but a lot of people, is giving gifts to those in power. So instead of yelling at them outside, I hand them something like a custom handkerchief and say, "Don't blow me away."

Use your power for good.

We know you have a difficult job in a position of power.

may I assist you? "

And what's great for introverts is that you can write letters while making these gifts. So for us Marks and Spencers, we tried to campaign for them to achieve a living wage.

Therefore, all 14 officers ordered handkerchiefs.

We wrote letters to them, packed them in boxes, went to shareholder meetings, handed them gifts, and had intimate activities in the form of discussions with them.

And what was great was that the chairman told us how great our campaign was and how heartfelt it was.

Board members like Martha Lane Fox, who has hundreds of thousands of followers on Twitter and is a big force in the business world, tweeted how impressed she was, and within 10 months we met with Marks and Spencer and said:

And we love Marks and Spencer.

How can we become the role models we want? ”

It was an intimate form of activity.

We had many meetings with them.

Then we gave them Christmas cards and Valentine's cards and said, "We really want to encourage them to implement a living wage. And within 10 months they announced to the media that they were going to pay an independent living wage. And now -- (applause) thank you."

And now we are working with them towards certification, which is very important. I returned to our last AGM in June this year and had a wonderful one-on-one discussion with members of the Board. They talked about how much they loved the handkerchiefs, how impressed they were, and what we were doing. They all said that if we weren't standing outside shouting at them and being nice to them in protest, they wouldn't even listen to us, wouldn't care about arguing with us.

And I think introverts are good at intimate activities. Because we like to listen, we like one-on-ones, we don't like small talk, we like big, important issues to discuss with people, we don't like conflict, so we avoid conflict at all costs. This is very important when trying to get involved with those in power to avoid constantly conflicting with them.

The third reason I think activists are really missing an opportunity if they aren't engaging with introverts is that, as I said, introverts can make up half the world's population, yet most of us don't say we're introverts, and we're embarrassed to say things that overwhelm us.

A few years ago my mom used to text me in capital letters, but now emoji can do anything too, so that's okay. But as soon as I saw this text, I frowned and thought, "Oh, capital letters, too many."

And I have to ignore it to read the nice text she sent me.

It's a bit embarrassing to tell people that capital letters overwhelm them, but we really need introverts to help us with interesting activities that attract introverts instead of alienating them.

We get sick of big, cheeky giant posters, big letters and instructional marks that tell us what to do and vie for our attention.

So some of the things that I'm doing with people from all over the world that I attend is creating tiny pieces of provocative street art that are hanging from eye level, and they're provocative messages.

They are not preaching or telling people what to do.

They just let people participate in different ways and think for themselves. Because we don't like being told what to do.

It may have a green heart on its sleeve, and we wear it, with things we like and how climate change will affect it. And if people ask, "Why are you wearing a green heart with the word 'chocolate' in it?"

Then have an intimate one-on-one conversation and say, "I love chocolate.

Climate change will affect that, and I think there are many other things that climate change will affect, and I really want to be able to be part of the solution, not the problem. ”

And I hate being the center of attention, so I turn away with, "What do you like? How will climate change affect it?"

Or maybe it's a shop drop rather than a shoplifter, creating a little mini scroll with the sweet story behind your outfit.

Is it a fun or torturous story about how it's made?

And just put it in the little pocket of the store, all lowercase, all handwritten, with ribbons of kisses and smiley faces, and people will be thrilled they found it.

And we often end up dropping them in unethical stores or front pockets. This is how we can have offline campaigns that engage other people online and offline in interesting ways without engaging and burning us out.

So there are two calls to action: introverts and extroverts.

For an ambivalent person, you are in it all.

My advice to extroverts is to think introverts when planning your campaign.

Consider how valuable our skills are as much as those of an extrovert.

We are good at slow thinking and deep thinking, and we are good at uncovering the details of a problem.

We are good at intimate activities, so use them as such.

And we are good at keeping people interested by doing weird little things that help generate conversation and thought.

My call to action for introverts is I know you like being alone, you like being in your head, but sometimes you have to go out because activities need you.

That doesn't mean you have to get extroverted and burn out just because it doesn't help anyone. But what that means is that you should value your skills and traits that an activist needs.

So for everyone in this room, whether you're extroverted, introverted, or ambidextrous, the world needs you now more than ever. And you have no excuse not to get involved.

thank you.

(applause)

Chris Anderson: Help me understand what machine learning is. Because machine learning seems to be the main driver of much of the excitement and concern about artificial intelligence.

Sebastian Thrun: So artificial intelligence and machine learning have been around for about 60 years, but they never had a great day until recently.

The reason is that today we have reached the scale of compute and datasets needed to make our machines smart.

Here's how it works:

Now, when you program a computer, say a cell phone, you hire a software engineer to write a very long kitchen recipe like, "If the water is too hot, turn it down."

If it's too cold, raise the temperature. ”

The recipe isn't just ten lines long.

They are millions of lines long.

A modern mobile phone contains 12 million lines of code.

Browsers have 5 million lines of code.

And each bug in this recipe can crash your computer.

That's why software engineers make so much money.

The new thing is that computers can find their own rules.

So instead of having an expert decipher the rules step by step for every contingency, we can give the computer an example and let the computer guess its own rules.

A really good example is AlphaGo, which was recently won by Google.

Usually gameplay involves actually writing down all the rules, but in the case of AlphaGo, the system was able to look at over a million games to guess its own rules and beat the world's Go champions.

This is very interesting. Because software engineers don't have to be super smart anymore, and data is taxing.

As I said earlier, this is the inflection point that actually made it possible. Very embarrassing, but my thesis was on machine learning.

Please don't read it as it makes no sense at all. That was 20 years ago, and computers back then were as big as cockroach brains.

Now they are powerful enough to actually emulate some kind of specialized human thinking.

And it takes advantage of the fact that computers can see far more data than humans.

In other words, it can be said that AlphaGo has examined over 1 million games.

A human expert cannot study a million games.

Google has examined over 100 billion web pages to date.

No one can study 100 billion web pages.

As a result, computers can find rules that even humans cannot.

CA: So instead of looking ahead and saying, "If he does that, I'll do that," you're saying, "This looks like a winning pattern, this looks like a winning pattern."

ST: Yes. That is, think about how you are raising your children.

Children can have this massive program without having to spend the first 18 years giving them the freedom to give them rules for every contingency.

They stumble, fall, get up, get slapped and slapped, but have a good experience and do well in school and work it out themselves.

That's what's happening with computers today, and suddenly computer programming is so much easier.

Think no more. We just give them tons of data.

CA: So this has been the key to the dramatic improvement in the capabilities of self-driving cars.

I think you gave an example.

Could you please explain what is happening here?

ST: It's a self-driving car drive that happened to be in Udacity and recently got a spin-off called Voyage.

We used something called deep learning to train a car to drive itself. Cyclists and pedestrians drive through 133 traffic lights on a rainy day from Mountain View, CA to San Francisco.

The novelty here is that many months ago I started the Google self-driving car team.

And a long time ago, I hired the world's best software engineer to find the world's best rules.

It has just been trained.

We drive this road 20 times, input all the data into the computer brain, and after hours of processing, the computer often comes up with a move that exceeds human agility.

This made programming very easy.

It's 100 percent self-driving, about 53 miles, 1.5 hours.

CA: So let me explain -- the left-most part of this program is basically showing what the computer sees as a truck or a car and the dots passing it.

ST: The camera image is displayed on the right. This is the main input here, used to find lanes, other cars and traffic lights.

Vehicles are equipped with radar for estimating distance.

This is very commonly used in this kind of system.

On the left is a laser diagram showing obstacles such as trees drawn by the laser.

But now almost all interesting works are centered around camera images.

We are making a real move away from high-precision sensors like radar and lasers to very cheap commoditized sensors.

The camera costs less than $8.

CA: What's that green dot on the left?

Does it make any sense?

ST: This is a look-ahead point for Adaptive Cruise Control, so it helps you understand how to adjust your speed based on the distance to the car in front.

CA: So I think we also got an example of how the actual learning part is done.

Maybe you can figure it out. Please talk about this.

ST: This is an example where we challenged Udacity students to sit for what we call a nano-degree in self-driving cars.

We gave them this dataset and said, "Hey, can you figure out how to drive this car?"

Looking at the images, it's pretty impossible, even for a human, to get the steering wheel right.

And then we held a contest and said, "This is a deep learning contest, an AI contest," and gave the students 48 hours.

So for software houses like Google and Facebook, this kind of work takes at least six months of work.

So we thought 48 hours was great.

Within 48 hours, we had about 100 submissions from students, and the top 4 were completely correct.

Using deep learning to drive better than I can with this image.

Again, same methodology.

It's like this magic.

Now, give a computer enough data, give it enough time to make sense of that data, and it will find its own rules.

CA: So that has led to the development of powerful applications in all kinds of fields.

The other day you were talking to me about cancer.

Can I show you this video?

ST: Yes, please. CA: This is cool.

ST: It's kind of an insight into what's going on in a completely different realm.

In the eyes of the beholder, this is augmenting or competing with people who are paid $400,000 a year, dermatologists and highly trained professionals.

It takes more than 10 years of training to become a good dermatologist.

What you see here is the machine learning version of that.

It's called a neural network.

"Neural network" is the technical term for these machine learning algorithms.

They have been around since the 1980s.

It was invented in 1988 by a Facebook Fellow named Yann LeCun and propagates data stages through what is thought to be the human brain.

It's not exactly the same, but it emulates the same.

It goes from step to step.

The first stage takes visual input and extracts edges, rods and dots.

And the next one has more complex edges and a small half-moon shape.

And finally, you will be able to build very complex concepts.

Andrew Ng has shown that it is possible to detect cat faces and dog faces from a huge amount of images.

My student team at Stanford University has shown that training with 129,000 images of skin conditions, including melanoma and carcinoma, can do as good a job as the best human dermatologists.

And to be sure this is the case, we took our own dataset, presented it to our network and 25 board-certified Stanford-level dermatologists, and compared them.

And in most cases, they equaled or exceeded the performance classification accuracies of human dermatologists.

CA: You told me an anecdote.

Now imagine this image.

what happened here?

ST: It was last Thursday. It's a moving piece.

What we've shown so far, and published in Nature earlier this year, was the idea of ​​showing a dermatologist's image and a computer program's image and counting how good they were.

However, these images are all images of the past.

All have biopsies to ensure the classification is correct.

This was not the case.

This was actually done by one of our collaborators at Stanford.

According to the story, our collaborator, a world-renowned dermatologist, is one of the three fingers, and when he saw this mole, he said, "This is not skin cancer."

And then there was the next moment and I said, "Okay, let's check it out in the app."

So he pulled out his iPhone, ran our software, a "pocket dermatologist," so to speak, and the iPhone said, "Cancer."

I said melanoma.

and he was confused.

Then he decided, "Okay, maybe I trust my iPhone a little more than I do," and sent it to the lab for a biopsy.

And it turned out to be malignant melanoma.

Therefore, I believe this is the first time in practice using deep learning that we have actually found an actual person with melanoma without deep learning.

CA: I mean, it's great.

(Applause.) I feel like an app like this is going to be in demand right now, and it's going to surprise a lot of people.

Why don't you make an app that can self-check?

ST: So my inbox is filled with cancer apps and people's heartbreaking stories.

I mean, some people have had 10, 15, 20 melanomas removed, and I'm afraid one of them will be missed, like in this example. And you probably don't even know about flying cars and loudspeakers inquiries these days.

My view is that further testing is needed.

I would like to be very careful.

It's very easy to get flashy results and impress the TED audience.

It's much harder to get ethical stuff out there.

And if people use apps and choose not to seek help from a doctor just because we are wrong, I would really regret it.

So we're doing clinical trials right now, and once those trials are started and the data are maintained, at some point we might be able to take this kind of technology out of the Stanford clinics and into places all over the world where Stanford doctors have never set foot.

CA: So does this sound correct? In a way, it seemed like you were saying that since you're working with this legion of Udacity students, you're applying a different form of machine learning than what's done inside the enterprise: combining machine learning with a form of wisdom-of-the-crowds.

Does that mean that even a giant company sometimes thinks it can actually exceed what it can do?

ST: I think there is a shocking event for me now, but I am still trying to understand.

Chris is referring to these contests that we run.

Within 48 hours, we were able to spin them around and build a self-driving car capable of driving on surface roads from Mountain View to San Francisco.

After seven years of work, we're not quite there yet, but we're getting there.

And it only took two engineers and three months to do this.

The reason is that we have an army of students who participate in competitions.

We're not the only ones using crowdsourcing.

Uber and Didi use crowdsourced driving.

Airbnb uses crowdsourcing for hotels.

There are now many examples of crowdsourcing bug discovery and protein folding.

But having built this car in three months, I'm actually rethinking the way companies are organized.

We have 9,000 staff, never hired, never fired by me.

They show up at work, but I don't know.

Then they'll probably submit 9,000 responses to me.

I am under no obligation to use them.

After all, I only pay winners. I mean, you're really going to be very cheesy here, which is probably not the best course of action.

But they think it's part of the education too, which is great.

But these students were able to produce amazing deep learning results.

Yes, great people combined with great machine learning is great.

CA: So Gary Kasparov said that on the first day [of TED2017], the chess winners surprisingly turned out to be two amateur chess players with three mediocre, mediocre-to-excellent computer programs that managed to outperform one grand master and one great chess player, as if it were all part of the process.

And it sounds like you're talking about a richer version of the same idea.

ST: Well, I mean, yesterday morning when you saw the amazing panel, the two sessions on AI, robot overlords, and human response, you said a lot of really great things.

One concern, however, is that sometimes we confuse what is actually done with AI with the threat of this kind of ruler that AI develops consciousness.

The last thing I want is for the AI ​​to be conscious.

I hate it when you come into the kitchen and are told the fridge has gone crazy with the dishwasher and the food was warm because I wasn't being nice enough.

I wouldn't buy or want something like this.

But the truth is, for me, AI has always been an extension of humans.

It strengthened us and made us stronger.

And I think Kasparov was just right.

The combination of human smarts and machine smarts has made us stronger.

The theme of machines making us stronger is as old as machines came along.

The Agricultural Revolution happened because we built steam engines and farm machinery that could not farm on their own, but they never replaced us. It made us stronger.

And I believe this new wave of AI will make us much stronger as humans.

CA: I'll explain a bit more about that, but I'll continue with this scary part for some people. For example, what scares people is when computers can rewrite their own code. So a computer can create multiple copies of itself, try many different, possibly random, versions of the code and check them to see if a goal has been achieved and improved.

So let's say your goal is to do better on an intelligence test.

Any reasonably powerful computer can try millions of versions.

I might find a better one and repeat it.

The concern is that everything will be fine on Thursday evening, and when you come back to the lab on Friday morning, you'll have a kind of runaway effect. Things go crazy because of the speed of the computer or something, and all of a sudden -- ST: I think it's a possibility, but it's very unlikely.

Now let's translate what you said.

For AlphaGo, this is exactly what happened. The computer plays games with itself and then learns new rules.

And machine learning is about rewriting rules.

It's a code rewrite.

But I don't think there was any concern that AlphaGo would conquer the world.

I can't even play chess.

CA: No, no, no, but now it's all very single-domain stuff.

But it is possible to imagine.

I mean, I've just seen a computer that could almost pass a college entrance exam. This computer may not be able to read or understand in the same way that we do, but it could certainly absorb all the text and increase the patterns of meaning.

Couldn't there be another kind of runaway effect as this expands?

ST: That's where I draw the line, to be honest.

And there is an opportunity -- I don't want to take it lightly -- but I think it's remote, and it's not on my mind these days. Because I think it's different from a big revolution.

Everything that has been successful in AI so far has been highly specialized and has thrived on a single idea: large amounts of data.

The reason AlphaGo works so well is because of the sheer number of games of Go, but AlphaGo can't drive a car or fly an airplane.

Google's self-driving cars and Udacity's self-driving cars run on tons of data, and they can't do anything else.

I can't even control my bike.

This is a very special, domain-specific feature, and the same applies to cancer apps.

There has been little progress on what is called "general purpose AI" where you go to AI and say, "Invent special relativity or superstring theory."

It's completely childhood.

The reason I want to emphasize this is because I understand the concerns and I want to acknowledge them.

But if I think about one thing, I ask myself, "What if we could take all the repetitive work and be 100 times more efficient?"

After all, 300 years ago we were all farming, farming, doing repetitive things.

Today, 75% of us work in offices, doing repetitive tasks.

We have become spreadsheet monkeys.

It's not just low-wage workers.

We became repetitive dermatologists and repetitive lawyers.

I think we are on the verge of introducing AI to monitor over our shoulders. With AI, we're probably 10x to 50x more efficient at these repetitive tasks.

That's what I have in my head.

CA: That's very exciting.

The process of getting there can seem a little intimidating to some. Because when computers will be able to do this repetitive task much better than dermatologists and drivers, which is something we are talking about especially now, suddenly millions of jobs are gone and before we reach the brighter side of our potential, as you know, this country is in the midst of a revolution.

ST: Well, it's a problem, a big problem, and it was pointed out yesterday morning by some of our guest speakers.

Well, before going on stage, I confessed that I am a positive and optimistic person. So let me make an optimistic pitch. That is, remember yourself 300 years ago.

Europe had just survived 140 years of war, and no one could read or write, and there were no investment bankers, software engineers, TV anchors, or any of the jobs we have today.

We were all in the fields and farm work.

Now here little Sebastian came in with a little steam engine in his pocket and said, "Hey guys, look at this.

Then you'll be 100 times stronger, so you can do other things. ”

We didn't have a full-fledged stage at the time, but Chris and I were in the stable playing with the cows. “I milk my cows every day, so that really worries me. What if a machine did this for me?”

The reason I mention this is because we are always well aware of past advances and their benefits: iPhones, airplanes, electricity, medical supplies.

We all want to live to be 80, but 300 years ago that was not possible.

But we don't apply the same rules to the future.

Looking back at my work as a CEO, I can say that 90% of my work is repetitive, unenjoyable, and I spend about 4 hours a day on silly repetitive emails.

And I'd love to get something to help me get rid of this.

why?

Because I believe we are all insanely creative. I love the TED community more than anyone else.

But even a blue-collar worker can go to a hotel maid, have a drink with her, and come up with a creative idea an hour later.

This will allow you to put this creativity into action.

For example, what if you could build Google in a day?

What if you could have a beer and invent the next Snapchat, whatever it was, and have it up and running tomorrow morning?

And it's not sci-fi.

What happens next, we are already in history.

We have unleashed this amazing creativity by freeing slaves from farming and, of course, factory labor, and have invented so many things.

In my opinion, even better.

And there will be big side effects.

One of the side effects is that food, medical supplies, education, housing, transportation, etc. will all become much more affordable for all of us, not just the wealthy.

CA: Hmm.

So when Martin Ford argued that this time is different because the intelligences we've used in the past to find new ways of being are matched at the same pace by the computers that take over them, what I heard is that it's not entirely due to human creativity.

Do you think that's fundamentally different from the creativity that computers can do?

ST: So this is my firm belief as an AI practitioner. In short, we haven't seen any real progress when it comes to creativity and out-of-the-box thinking.

What I see now -- and this is very important for people to understand. Because the word "artificial intelligence" is very threatening. Then Steve Spielberg throws in a movie, where suddenly the computer is our champion, but it really is technology.

It's a technology that helps you do repetitive tasks.

And progress has been entirely iterative.

It was in the discovery of legal documents.

It was a contract.

I am having a chest x-ray.

And these are so specialized that they don't seem like a big threat to humanity.

In fact, as humans, we've become, let's be honest, superhuman.

We made us superhuman.

We can swim across the Atlantic in 11 hours.

We can pull a device out of our pocket and shout to Australia and he can shout back to us in real time.

It's physically impossible. We are breaking the laws of physics.

When this is said and done, we will remember everything we have said and seen, you will remember everyone too, which is good for me in the early stages of Alzheimer's.

I'm sorry, what did I say? I forgot.

CA: (laughter) ST: Probably IQ over 1,000.

No more spelling classes for the kids because there are no more spelling problems.

No more math problems.

And what really happens is, I think we can be very creative.

And so are we. we are creative

That's our secret weapon.

CA: So the jobs that are disappearing are, in a way, even painful, and humans are capable of more than those jobs.

This is my dream.

The dream is that humanity can reach new levels of empowerment and discovery.

That's my dream.

ST: And let's think about this. If you look at the history of mankind, even if it's 60,000 to 100,000 years ago, almost everything you care about—inventions, technologies, things we built—was invented in the last 150 years.

Including the book and wheels makes it a little dated.

Or an ax.

But your mobile phone, sneakers, chairs, modern manufacturing, penicillin, these are the things we hold dear.

Well, that means to me that in the next 150 years we'll find a lot more.

In fact, in my opinion, the pace of invention is going up, not down.

I think only 1% of interesting things have been invented yet. right?

We have not cured cancer.

We don't have flying cars yet. Hopefully this will change.

It used to be an example people laughed off. (Laughter) It's funny. We are secretly working on the development of flying cars.

We haven't lived twice as long yet. OK?

Our brains don't have magical implants that give us the information we want.

It may surprise you, but I promise you will love it once you get your hands on it.

I hope so.

It's a little scary, you know.

There are many things I haven't invented yet, so I think I'll invent them from now on.

We have no gravity shield.

We cannot beam ourselves from one place to another.

It sounds silly, but about 200 years ago, experts were of the opinion that flight didn't exist even 120 years ago and that moving faster than you could run would kill you instantly.

So who said we were right today that we can't beam people to Mars from here?

CA: Sebastian, thank you so much for your incredibly inspiring vision and talent.

Thank you Sebastian Thrun.

It was great. (applause)

Whether you realize it or not, as a surfer you are a master of complex physics.

The science of surfing begins the moment you and your board first touch the water.

The board's size and lightweight construction allow it to evacuate large amounts of water.

A buoyant force equal to the weight of the displaced water is then pushed up, opposing the weight of you and the board.

This allows you to stay afloat while waiting to paddle into the waves.

And what are you waiting for?

Perfect waves of course.

Like other waves in physics, ocean waves represent the transfer of energy.

Wind across the ocean accelerates water particles near the surface, causing them to grow into ripples that form waves.

These deviations from a flat surface are affected by gravity, which tends to return the surface to its original flat state.

As waves move through the water, the pressure caused by the waves causes particles to push or pull on neighboring particles, and this motion is synchronized with the motion of the waves to propagate energy into the water.

The motion of these particles is much more constrained than the motion of whole waves.

Since the seafloor is shallower near the coast, wave motion occurs in a more limited area than at 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 shore as they approach.

This is the critical moment.

As the wave approaches, quickly rotate the board in the same direction as the wave and paddle to match the speed of the wave.

The board forms an angle with the water, which creates dynamic pressure on the bottom of the board, pushing you and the board out of the water and causing you to glide along the surface.

At the same time, the increased forward momentum makes your body more stable, allowing you to stand up and surf along the wave.

Now you are riding a wave, riding along the front of the wave parallel to the coastline.

Surfboard fins allow you to change speed and direction by changing the position of your weight.

Above you is a wave crest, where water particles are undergoing maximum acceleration.

As such, it has to move faster than the waves beneath it, allowing it to leap forward before it can be affected by gravity.

This creates a characteristic curl, or jet, of waves crashing along the shore.

In some cases, the curl can completely enclose part of the wave, forming a moving water tube known as a barrel.

Few barrels last as long as the legendary 27-second voyage off the coast of Namibia, due to the irregularities in the seafloor and the swell itself.

But many who manage to ride Barrel say time feels different indoors, making it one of the most magical experiences for surfers.

Of course, not all beaches are created equal.

Offshore underwater canyons and rock formations at certain locations, such as Nazaré, Portugal and Mavericks, California, refract the energy of incoming waves into a single point, creating the gigantic waves sought after by surfers around the world.

And some of these waves travel for a week or more, with swells originating more than 10,000 kilometers from the coast.

Waves surfed in sunny California may have originated in stormy waters near New Zealand.

So while you may not be thinking about the weather patterns, crustal structure and hydrodynamics of the South Pacific, your perfect wave-catching technique depends on all these and more.

And the waves created by the wind we surf are just a visible part of the ongoing vibration of energy that has shaped our universe since its inception.

Start here.

Now wait a minute.

(grunts) I understand.

(laughs) Oh, I'm sorry.

(music) (beatbox) Thank you.

(applause)

On March 3, 1913, protesters parted for a woman dressed in white. It was almost impossible to miss activist Ines Milholland, who wore a flowing cloak and rode a white horse.

She spearheaded the Women's Suffrage Parade, the first major nationwide protest for women's voting rights.

Thousands of women flocked to Washington, D.C. after months of strategic planning and debate.

Here they called for a constitutional amendment to give them the right to vote.

By 1913, women's rights activists had been working for decades.

As a disenfranchised group, women had no say in the laws that affected their lives and the lives of others.

However, they struggled to garner widespread support for political equality.

It had not won a major victory since 1896, when Utah and Idaho gave women the right to vote.

This brings the total number of states that allow women to vote.

A new media-savvy spirit has emerged in the form of Alice Paul.

She was inspired by British women's suffragists who went on hunger strikes and endured imprisonment in the early 1900s.

Rather than conduct costly campaigns state by state, Paul called for the long-term impact of constitutional amendments that protect women's voting rights across the country.

As a member of the National Women's Suffrage Association, Paul proposed a major contest to build support and revitalize the movement.

Washington officials initially rejected her plan and then tried to sidetrack the march.

However, Paul reversed those decisions and approved a parade the day before Woodrow Wilson's inauguration.

This maximizes media coverage and captures the attention of the crowds that will likely gather in the city.

However, when planning the parade, Paul focused primarily on appealing to white women of all backgrounds, including those who were racist.

She actively discouraged participation by African-American activists and groups, saying those who participated should march in the back.

But black women will not be invisible in a national movement that they helped shape.

On the day of the march, groundbreaking investigative journalist and anti-lynching advocate Ida B. Wells-Burnett refused to back down and marched proudly under the Illinois flag.

NAACP co-founder Mary Church Terrell joined the 22 founders of the Delta Sigma Theta Sorority, an organization founded by Howard University female students, in the parade.

In this and other ways, black women persevered despite deep hostility from white women in the movement and at great political and physical risk.

On the day of the parade, women's suffrage advocates gathered to create a powerful exhibit.

A burgeoning section of the procession included international suffragettes, artists, performers and business owners.

The floats were in the shape of golden chariots. Giant Liberty Bell. and a map of the entitled countries.

On the steps of the Treasury building, performers performed women's historical feats to live orchestral music.

The marchers continued as mobs blocked their way, insulting and spitting on women, throwing cigars and physically assaulting participants.

Police did not intervene and eventually more than 100 women were hospitalized.

Their abuses were widely reported across the country, and the parade quickly gained public attention and garnered a great deal of sympathy from suffragettes.

National newspapers condemned the police, and congressional hearings investigated police behavior during the parade.

After the protests, the Women's Journal wrote, "Washington has been shamed. Equal suffrage has won big."

The march thus sparked a surge in support for women's suffrage that persisted over the years that followed.

Suffragists continued to exert steady pressure on their representatives, attending rallies and petitioning the White House.

A woman on a white horse, Innes Milholland, campaigned constantly across the country despite having chronic health problems.

She did not live to see her efforts come to fruition.

In 1916, she collapsed during a speech on suffrage and died shortly afterwards.

According to popular reports, her last words were: President, how long must women wait for their freedom? It would take decades to fully include voting rights, but in 1920 Congress ratified the 19th Amendment, finally giving women the right to vote.

This is an elementary school in Columbus, Ohio.

And there was a student named D in this school.

D was six years old when he started school here. As cute as a button, she had a smile that seemed to brighten up the whole room.

But after a few months of school, D became angry and the smile faded.

D began to overturn tables, throw desks and chairs, yell at teachers, stand by windows, walk in and out of classrooms, and even run away from school.

At times, these bouts of anger would put the entire school in lockdown mode until D got back on his feet, sometimes for an hour or more.

No one at school knew how to help D.

I know that because I was the principal of this school.

And what I quickly learned with my staff was that this situation was more extreme than anything we had ever been trained in.

Every time D ranted, I kept thinking about myself. What did I miss in the main preparation course?

What to do with a child like D?

And how do we stop him from interfering with the learning of all other students?

Yet, after doing all the things we thought we knew, like talking to D, taking away privileges, and calling home from parents, we knew the only real option left was to kick him out, and that wouldn't help him.

This scenario is not specific to D.

Students around the world are struggling with their education.

And while we didn't come up with a solid solution, we did come up with a simple idea. In order for children like D to not only survive in school, but thrive, they must somehow find ways to not only teach them to read and write, but also help them deal with and manage their emotions.

In doing so, our school was able to rise from one of the worst F-rated schools in Ohio to a C in just a few short years.

Sounds obvious, right?

Of course, teachers should focus on the mental well-being of children.

But in reality, when you're in a classroom with 30 students and one of them is throwing a table at you, it's much easier to get rid of that student than figure out what's going on in that student's head.

But what we've learned about D, and for kids like D, is that small changes can make a big difference, and you can start now.

We don't need bigger budgets or grand strategic plans. All it takes is a smarter way of thinking about what you have and where you keep it.

In education, we tend to always look outside the box for answers, and rarely spend enough time, money, and effort developing what is already inside the box.

This is how meaningful change happens quickly.

So here's what I learned about D.

I wanted to dig a little deeper to understand why he was so angry.

And what I learned was that his father had left home and his mother worked long hours to support the family, so he had no adults to contact and he was in charge of taking care of his little brother when he got home from school.

Can I remember that D was 6 years old?

I can't blame him for having a hard time transitioning into a school environment.

But we had to find a way to soften this big feeling while teaching him basic skills in reading and math.

And three things helped me the most.

First, I needed to figure out where he was struggling the most.

And like most young children, when they arrive at school it can be a tough transition period as they move from an unstructured home environment to a more structured school environment.

So what we did for D was create a comfy place in the timeout room with a rocking chair, soft cushions and books, and allow D to go to this place in the morning away from the other kids and give him time to go back to the school environment of his own accord.

And as we started learning more about D, we learned another strategy to calm him down.

For example, Ms. D loved to help young children, so she made her a kindergarten maid and entered a kindergarten classroom to teach children how to write letters.

And he actually succeeded in some assignments that teachers couldn't reach.

And believe it or not, D actually helped calm some kindergarteners, showing us that peer influence on behavior is far greater than we adults can do.

We used humor and songs with him.

Yes, I know it sounds really silly that principals and teachers actually laugh with the kids, but you can imagine the shock on D's face when the principal told a joke or sang a radio station song, but it mostly ended in laughter, shortening the length of his outbursts and helping us connect with the principal's world.

Some people may think that it is unrealistic to give all students such special treatment, but we have actually made it happen.

Because once we understand the tools and tactics that work for D, teachers can deploy them for other students.

Instead of simply reacting to student behavior, we actively deal with it.

In fact, our teachers took time in their lesson plans to teach children how to identify their emotions and appropriate healthy coping strategies to deal with them, such as counting to 10, grabbing a fidget spinner, and brisk walking.

We incorporated brain breaks throughout the day, allowing children to sing songs, do yoga poses, and participate in structured physical activity.

And for kids who struggle to sit for long periods of time, we've invested in flexible seats like rocking chairs and stationary bikes, as well as floor elliptical machines that kids can pedal under their desks.

These changes allowed children to stay in the classroom and focus on learning.

And when fewer children get in the way, all children do better.

And here's where the magic happens. It didn't cost me any extra money.

We simply thought differently about what we had.

For example, every public school has a material supply line.

Teaching materials could be books, whiteboards, flexible chairs, fidget spinners, or even painting the walls of the school a more subdued color to help students thrive.

That's not to say I haven't invested in academic tools, but I've been serious about social tools as well.

And the results speak for themselves.

By taking children's emotional development seriously and helping them manage their emotions, we saw significant improvements in reading and math performance, far exceeding the expected one-year gains and surpassing many schools in our demographic.

The second thing we did to help children manage their emotions was to use leverage.

As a public school with little funding, we didn't have the support staff to handle the turmoil our children could face at home. Nor was it trained or funded to deal directly with it.

So we started contacting local groups, community groups, and even Ohio State University.

Through our partnership with Ohio State University, we college students were able to learn not only education, but also school psychology and school social work.

These students were paired with teachers to help those students who had the most difficulty.

And everyone benefited because teachers had access to the latest college-level thinking, and college students got real-world life experiences in the classroom.

In partnership with the local Nationwide Children's Hospital, we have built a clinic within our school to provide our students with health and mental health resources.

And our children also benefited from this.

Our absenteeism continued to decline and our children were able to receive counseling during class.

And perhaps the biggest change was none at all for D or the children.

It was among the adults in the room.

Teachers are usually good at planning and implementing instruction, but they can feel completely outside the scope of their duties when disruptive.

But as we take children's emotional development seriously, we've moved from a philosophy of exclusion (get out of the way) to a philosophy of trust and respect.

It wasn't easy, but we really felt it. This was a positive way to make a change. I am in awe of the teachers who have made that leap with me.

As part of our personal professional development program, we studied the work of Dr. Bruce Perry and his research on the effects of childhood experiences on the developing child's brain.

And what we've learned is that some of our students' experiences, such as parental absence, turbulent home life, poverty and illness, create real trauma for the developing brain.

Yes, trauma.

I know this is a very strong word, but it helped me reframe and understand the behavior we were seeing.

And these difficult home experiences created a real barbed wire barrier to learning that we had to find a way to overcome.

So the teachers continued to practice with the lesson plan, running a single, focused, short lesson plan to help the kids stay focused, and continued to incorporate breaks in these movements so the kids could hop around the class or dance for two minutes straight. It turns out that taking breaks helps learners retain new information.

And may I add that the 'Cha-Cha Slide' provides the perfect short dance party.

(laughs) I saw the teachers saying, "What's wrong?"

instead of "what's wrong?"

Or "How can I help you?" instead of "Get out."

And this investment in our children has made a big difference, and our academic performance continues to rise.

Thankfully, once D was in fourth grade, he rarely got into trouble.

He became the leader of the school and this behavior became contagious to other students.

We saw and felt that despite the influence from the outside, the school atmosphere continued to improve, becoming a happy and safe place not only for children but also for adults.

Going back to today, I am currently working on an alternative education program for high school students who struggle to function well in a traditional high school environment.

I recently reviewed some of their history.

Many of them are 17-18 years old and have experimented with drugs, been in juvenile detention centers or been expelled from school.

And what I discovered was that many of them displayed the same behavior I had seen in D, who was 6 years old.

So I can't help but wonder. If these kids had learned early and healthy coping skills during difficult times, would they be able to survive in a normal high school today?

I can't say for sure, but I have to say that I believe it helped.

And the time has come for all of us to take our child's social and emotional development seriously.

Now is the time for us to step up and say what we should do for our children.

What would happen to our community if we taught our children to read and write and graduated without knowing how to control their emotions?

I tell people, ``You can invest now, you'll pay later.''

Now is the time for us to invest in our children.

They are the people of our future, not just numbers that pass or fail a test.

thank you.

(applause and cheers)

No one likes making mistakes.

And I made something outrageous.

And understanding what I was doing wrong led to discoveries that completely changed the way we think about the Earth and the Moon.

I'm a planetary scientist and my favorite thing to do is shatter planets.

(Laughter) In my lab, you can use cannons like this to shoot rocks.

(cannon fire) (laughter) In my experiments, we can create extreme conditions during planet formation.

And with computer models, you can crash entire planets to grow or destroy them.

(Laughter) I want to understand how the Earth and the Moon are made and why the Earth is so different from other planets.

The prevailing idea about the origin of the Earth and Moon is called the "Giant Impact Theory".

This theory states that an object the size of Mars collided with the young Earth, and the Moon formed from a disk of debris around the planet.

While this theory can explain a great deal about the Moon, it is deeply flawed. The Moon is mainly made of Mars-sized planets, and we predict that the Earth and the Moon are made of different materials.

But that's not what we see.

The Earth and Moon are actually like identical twins.

The planet's genetic code is written in the isotopes of the elements.

The Earth and Moon have the same isotopes.

In other words, the earth and the moon are made of the same material.

It's really strange that the earth and the moon are twins.

All planets are made of different materials, so they all have different isotopes and have their own genetic code.

No other planet has the same genetic relationship.

Only the Earth and Moon are twins.

When I started researching the origin of the Moon, there were some scientists who tried to deny the whole idea of ​​a giant impact.

They didn't understand how this theory could explain the special relationship between the Earth and the Moon.

We were all trying to come up with new ideas.

The problem is, I haven't had a better idea than this.

All other ideas had even bigger flaws.

So we were trying to save the giant impact theory.

A young scientist in my group suggested changing the rotation of the giant impact.

Perhaps if the Earth rotates faster, more matter will be mixed in and explain the moon.

A Mars-sized impactor was chosen because it could create the Moon and the length of an Earth day.

People really liked that part of the model.

But what if something else determined the length of a day on Earth?

That would make the potential for a giant impact that could create the Moon even more likely.

Curious to see what would happen, they simulated a faster spinning giant impact and found that it was possible to create a disk out of the same mix of materials as the planet.

we were pretty excited.

Perhaps this was the way the moon was explained.

The problem is, I also found that chance to be very low.

For the most part, disks are unlike planets, and it seemed like an astronomical coincidence for the Moon to form this way, but it was hard for anyone to accept the idea that the Moon's special connection to Earth was accidental.

The giant impact theory was still in trouble, and we still hadn't figured out how the moon was made.

Then came the day when I realized my mistake.

My students and I were looking at data from a fast-spinning giant impact.

We weren't actually thinking about the moon that day, we were looking at the planets.

The planet becomes super hot and is partially vaporized by the energy of the collision.

But the data didn't look like a planet.

Looked really weird.

The planet was strangely connected to the disk.

I felt so excited when something really wrong could turn out to be really funny.

All my calculations assumed there was a planet with another disk around it.

As a way to test whether a collision could form a moon, we calculated what was inside the disk.

But it didn't seem so simple anymore.

We were making the mistake of thinking that planets would always look like planets.

That day, I learned that a giant jolt was creating something completely new.

I had an eureka moment.

This wasn't one of them.

(Laughs) I really didn't know what was going on.

I had this strange new object in front of me and the challenge was to make sense of it.

What do you do when faced with the unknown?

how do i start?

We wondered everything: what is a planet?

When do planets cease to be planets?

We played with new ideas.

We had to get rid of the old way of thinking, and playing allowed us to throw away all the data and all the rules of the real world and free our minds to explore.

And I was able to learn by creating a mental space where I could experiment with outlandish ideas and bring them back to the real world to test them.

And we learned a lot by playing.

Through a combination of laboratory experiments and computer models, I have discovered that after most giant impacts, the Earth becomes so hot that it has no surface.

There is a deep layer of gas, the deeper it gets, the denser it gets.

Earth would have become like Jupiter.

there is nothing to stand on.

And that was only part of the problem.

I wanted to understand the whole problem.

I couldn't give up the challenge of figuring out what was really going on in the giant impact.

It took about two years of throwing out old ideas and building new ones to understand the data and what it meant for the moon.

I discovered a new type of celestial body.

it's not a planet.

Made from planets.

A planet is a celestial body whose self-gravity is sufficiently strong that it has a round shape.

Spin around in unison.

If you make the equator hotter and spin faster, it gets bigger and bigger until it hits a tipping point.

Beyond the tipping point, the material at the equator spreads out in a disk shape.

It is now breaking all the rules of being a planet.

It can no longer rotate together and keeps changing shape as it gets bigger and bigger. The earth has become something new.

We named this discovery 'sinestia'.

I named it after Hestia, the Greek goddess of hearths and homes, because I think the earth has become one.

This prefix means "all together" and emphasizes the connection between all materials.

Synesthesia refers to what a planet looks like when heat and rotation push it beyond the limits of its spheroid shape.

Want to see Synestia?

(Cheers) In one of my simulation visualizations, the young Earth is already spinning at high speed from a previous giant impact.

Although its shape is distorted, our planet will be recognizable by the water on its surface.

The energy from the impact evaporates the surface, water and atmosphere, mixing all the gases in just a few hours.

We found that many giant collisions trigger synesthesia, but these burning bright objects don't have very long lives.

They cool, shrink, and return to the planet.

During the growth of a rocky planet like Earth, it probably changed into synestia one or more times.

Synesthesia gives us a new way to solve the lunar origin problem.

We propose that the Moon formed within a giant vapor synesthesia.

The moon grew from rains of magma that condensed steam on rocks.

The special connection between the Moon and the Earth is due to the Moon forming inside the Earth when the Earth was in resonance.

The moon may have orbited inside the resonance hidden from view for years.

The Moon emerges from a resonance phenomenon that cools and shrinks inside its orbit.

Synastea turns into planet Earth only after it cools down for hundreds of years.

Our new theory proposes that a colossal collision would create a coness that would split into two new bodies, forming the isotopically identical Earth and Moon.

Synestia has been created throughout the universe.

And by finding them in our imagination, we now realize what else is missing in the world around us.

What is hidden from my sight by my own beliefs?

The next time you look at the Moon, remember that what you think you know can be an opportunity to discover something truly amazing.

(applause)

African informal markets are typically seen as chaotic and lazy.

The downside of hearing the word “informal” is that we are automatically making massive associations, which is very negative, with significant consequences and economic losses, and can easily add or subtract 40-60 percent of profit margins from the informal market alone.

As part of our effort to map the informal trade ecosystem, we conducted an extensive literature review of all reports and studies on cross-border trade in East Africa going back 20 years.

This was to prepare for fieldwork to understand what is the problem and what is hindering informal trade in the informal sector.

What we have found over the last 20 years is that no one has differentiated between illegal things like tomatoes, oranges and fruit (like smuggled goods and those in the informal sector) and legal but undocumented things.

This criminalization of the informal sector – known in English as 'biashara' in Swahili for trade and commerce and 'majend' for smuggling and contraband – could easily add 60-80 percent to annual GDP growth in each African economy by not distinguishing between these dimensions. Because we do not recognize the dynamics that keep the economy running.

The informal sector is adding jobs four times faster than the traditional formal economy, or what many call the 'modern' economy.

It provides employment and income-generating opportunities for the most “unskilled” people in traditional fields.

But can you make a French fries machine out of an old car?

So, ladies and gentlemen, this is something that desperately needs to be recognized.

As long as the current premise exists that this is a crime, this is a shadow, this is illegal, there will be no attempt to integrate the informal economic ecosystem with the formal, or even the global, economic ecosystem.

Based on 20 years of literature research, we tell the story of Thearesia, a trader who overturned all our assumptions and made us question all the stereotypes we believed.

Teresia sells clothes under a tree in Maraba, a town on the Uganda-Kenya border.

Pretty simple, don't you think?

Go hang your new clothes on a branch, put up a tarp, and calmly wait for your customers. That's it.

She was everything we expected according to the literature and research, down to the point of being a business driven, single mother supporting her children.

So what changed our assumptions?

What surprised us?

First, Thearesia paid the county government's market commission each business day as a privilege to set up shop under the tree.

She's been doing it for 7 years and has a receipt.

She keeps records.

There is not a single socially disadvantaged and vulnerable African female trader on the side of the road.

We were meeting someone who holds the sales record for years. Who has a whole retail ecosystem coming from Uganda to pick up their inventory. It could be someone who brings you goods in a wheelbarrow, or a mobile money agent who comes to pick up your cash in the evening.

Can you guess how much Thearesia spends on average each month on inventory, the inventory of new clothes she gets from Nairobi?

1,500 USD.

This translates to approximately US$20,000 being invested in traded goods and services each year.

This is Thearesia, the invisible one, the hidden middle.

And she's just a fraction of the small entrepreneurs and micro-enterprises you'll find in these market cities.

At least on the wider Maraba border, she's on the first tier.

Further up the value chain, people invest US$2,500-3,000 a month to easily run three businesses.

So it turned out that the problem was not criminalization. You can't actually make the person you're asking for the receipt a criminal.

It is the lack of recognition of their skilled profession.

Banking systems and structures have no means of recognizing them as micro-enterprises. Let alone the fact that there is no forwarding address in her tree.

So she got stuck in the middle.

She's out of the niche of our assumptions.

Did you know there is a micro loan to support women traders in Africa?

They are going to lend her $50 or $100.

what is she going to do with it?

She spends ten times that amount each month on inventory alone. I'm not talking about additional services or support ecosystems.

These people are the low-skilled and marginalized people that the middle class is said to consist of, or those who don't fit the policy stereotypes of pensioners, white-collar workers, salaried workers, and civil servants.

Instead, what we have here are primitive small businesses, the rich seed of businesses and enterprises that keep their engines running.

They put the food on your table.

In this hotel, too, invisible people such as butchers, bakers, and candelabra build machines that make French fries and make beds.

These are invisible businesswomen trading across borders, all on the side of the road, invisible to data collectors.

And they're mixed with a vast informal sector that doesn't mind distinguishing between smugglers and tax evaders and those who do illegal things, and women who trade, put food on the table, and send their children to college.

That's what I'm really asking here.

That's all you need to start with.

Why not start by recognizing your skills and occupations?

Starting with this realization, we can transform the informal economy by designing customized gateways for them to enter and integrate into the formal economy, the global economy and the entire system.

Thank you ladies and gentlemen.

(applause)

I think we've all been fascinated at one time or another by the romantic mysteries of broken societies: the classical Maya of Yucatan, the Easter Islanders, the Anasazi, the Fertile Crescent Society, Angour Watt, the Great Zimbabwe. And in the past decade or two, archaeologists have shown that environmental problems underlie many past collapses.

But there were many places in the world where societies developed for thousands of years without any sign of major collapse, such as Japan, Java, Tonga, and Tikopea. So clearly, societies in some regions are more vulnerable than others.

How can we understand what makes some societies more vulnerable than others? This issue is clearly relevant to our situation today, as already broken societies exist today, such as Somalia, Rwanda and the former Yugoslavia. Some societies are close to collapse today, such as Nepal, Indonesia, and Colombia.

what about ourselves?

What can we learn from the past to avoid the kind of decline and collapse experienced by many societies in the past?

Clearly, the answer to this question is not a single factor. If someone says that the collapse of society can be explained by a single factor, you know that person is an idiot. This is a complicated subject.

But how do we make sense of the complexity of this subject?

In analyzing social collapse, I have arrived at a five-point framework. This is a checklist of things I'm trying to understand collapse. The five-point framework is then illustrated by the disappearance of the Nordic community in Greenland.

We are a European society with a literate record, so we know a lot about people and their motivations.

Vikings left and settled in Greenland in 984 AD, but by 1450 the Vikings were extinct. Society collapsed and everyone died.

Why are they all dead? In my five-point framework, the first item is to look for human impacts on the environment. That is, inadvertently destroying the resource base on which people depend. And in the case of the Norse Vikings, the Vikings inadvertently caused soil erosion and deforestation, which was a particular problem for them because they needed forests to make charcoal and to make iron.

So they became an Iron Age European society, practically unable to make their own iron. The second item on my checklist is climate change. The climate can be warm or cold, dry or wet.

For the Vikings, the climate became colder in Greenland in the late 1300s, especially in the 1400s. But cold weather isn't always lethal. This is because the Inuit (the Eskimos who lived in Greenland at the time) coped better with the cold climate, rather than making it worse. So why didn't the Norsemen in Greenland act as well?

The third on my checklist is relations with neighboring friendly societies that may support society. And if that friendly support is stripped away, societies may be more likely to collapse. In the case of the Greenlandic Nordics, they traded with their native Norway, but that trade declined. One reason is that Norway has weakened and one is the sea ice between Greenland and Norway.

The fourth item on my checklist is relationships with hostile societies.

In the case of Nordic Greenland, the adversaries were the Eskimos who shared Greenland, the Inuit, who had a bitter relationship with the Nordics. And we do know that the Inuit may have killed the Norsemen and, perhaps more importantly, cut off access to the outer fjords that the Norsemen relied on to obtain seals at key times of the year.

And finally, the fifth item on my checklist is the political, economic, social and cultural factors in society that make society more or less likely to recognize and solve environmental problems. For Nordics in Greenland, the cultural factors that made their problem-solving difficult were: that their involvement in the Christian community had invested heavily in cathedrals; They are primarily competitive societies. And they held contempt for the Inuit who refused to learn from them. This is how the five-part framework relates to the collapse and eventual extinction of Norsemen in Greenland.

What about today's society?

For the past five years, I have taken my wife and children to Southwest Montana. When I was a teenager there, I worked there harvesting hay. And Montana, at first glance, looks like the most pristine environment in the United States.

But on the surface, Montana is in serious trouble.

Would you consider the same checklist of human environmental impact?

Yes, it's serious in Montana. Toxic problems from mining waste cause billions of dollars in damages.

Problems with weeds and weed control cost Montana nearly $200 million a year. Montana has lost farmland to salinization, forest management problems, and forest fires. Second item on my checklist: climate change. Yes, Montana's climate is getting warmer and drier, but Montana's agriculture is particularly dependent on irrigation from snow cover, and as the snow melts, Glacier National Park's glaciers, for example, are disappearing, which is bad news for irrigated agriculture in Montana.

Number three on my checklist is social and social friend relationships. In present-day Montana, more than half of the income is not generated within Montana, but from outside the state, such as remittances from Social Security, investments, etc., making Montana vulnerable to the rest of the United States.

Fourth, relations with adversaries. Montanas have the same problem as all Americans in that they are sensitive to problems caused by foreign hostile forces and terrorist attacks affecting oil supplies. And finally, the final item on my checklist is the question of how political, economic, social and cultural attitudes affect this. Montanas have longstanding values ​​that today seem to get in the way of solving their own problems.

Years of dedication to logging, mining and farming, and never following government regulations. Values ​​that worked well in the past, but don't seem to work today.

So I look at the problem of collapse in many past societies and in many present societies.

Are there any general conclusions?

In a way, just as Tolstoy said that each unhappy marriage is different, each broken or crisis society is different. They all have different details. But nevertheless, there are certain commonalities that emerge from the comparison of past societies that have collapsed and threatened today's society. One interesting commonality often has to do with how quickly societies collapse after they peak. There are many societies that grow, become richer, more powerful, and then collapse within a short period of time, within decades of their peak, rather than gradually declining. For example, the typical lowland Maya region of the Yucatan began to collapse in the early 800s. Decades after the Maya built the largest archaeological site and the largest Maya population.

Alternatively, the collapse of the Soviet Union occurred within decades, perhaps within a decade, of the time when the Soviet Union was at its peak.

A similar example is bacterial growth in Petri dishes.

Such rapid collapse is especially likely when there is a mismatch between available resources and resource consumption, or between economic spending and economic potential.

Bacteria grow in the petri dish. Let's say it doubles every generation, 15/16 of the petri dishes are empty 5 generations before the end, 3/4 empty in the next generation, and half empty in the next generation. After the petri dish is still half empty, within a generation the petri dish will be full. The food has run out and the bacteria have collapsed.

So this is a common theme. Society collapses immediately after reaching the peak of power.

Mathematically speaking, if you are interested in today's society, you should not be concerned with the value of a mathematical function, or wealth itself, but with the function's first and second derivatives. That's one general theme. A second general theme is that there are many, often subtle, environmental factors that make some societies more vulnerable than others. Many of those factors are not well understood. For example, why has Easter Island become the most devastating case of complete deforestation out of hundreds of islands in the Pacific?

It turns out that there were about nine different environmental factors (some of them quite subtle) that had a negative impact on Easter Islanders, including volcanic ash fallout, latitude and rainfall. Perhaps the most subtle of them all is the finding that a major influx of nutrients that protects the Pacific island environment is due to the fallout of continental dust from Central Asia.

Easter Island receives the least dust influx from Asia among the Pacific islands, restoring soil fertility. But it's something we didn't realize until 1999.

Some societies are therefore more vulnerable than others for subtle environmental reasons. And finally, we make another generalization. I am currently teaching a course at UCLA to UCLA undergraduates on social breakdown. The real problem for UCLA undergraduates is how in the world didn't these societies see what they were doing?

Why did the people of Easter Island deforest their environment?

What did they say when they cut down the last palm tree?

Couldn't they see what they were doing? How could society not recognize the environmental impact and stop it in time?

And if our human civilization continues like this, I predict that perhaps in the next century people will wonder why today, in 2003, they didn't realize the obvious things they were doing and take corrective action.

It seems incredible in the past. In the future, what we are doing today will be incredible. So I have tried to develop a hierarchical series of considerations as to why society is unable to solve its problems, why it cannot recognize the problem, or even if it recognizes it, why it cannot address it. Or even if we work on them, why can't we solve them?

I will mention just two generalizations in this area.

One of the blueprints for the problem that increases the likelihood of collapse is when there is a conflict of interest between the short-term interests of the decision-making elite and the long-term interests of society as a whole, especially if the elite can protect themselves from the consequences of their actions. If what is good for the elite in the short term is bad for society as a whole, there is a real risk that the elite will do things that disrupt society in the long run.

For example, among the Nordics of Greenland, a society of competitive classes, what the chiefs really wanted was more followers, more sheep, and more resources to compete with neighboring chiefs. And that forced the chiefs to practice what was called land whipping, leaving the land overstocked and forcing the peasants into dependence. And while it made the chieftain powerful in the short term, it led to the collapse of society in the long term.

A similar conflict of interest issue is acute in the United States today. Especially since U.S. decision-makers are often able to protect themselves from consequences by living in gated premises, drinking bottled water, and so on. And in the last few years, it's clear that the business elite correctly recognizes that they can drive short-term profits by doing things that are good for them but bad for society as a whole, such as draining billions of dollars from Enron and others. They are quite right in claiming that while these things are bad for society in the long run, they are good for them in the short run.

This is one common conclusion about why society makes wrong decisions: conflicts of interest.

And another generalization I want to mention is that societies have a particularly difficult time distinguishing between citations and citations and making appropriate decisions when conflicts exist that involve strongly ingrained values ​​that are good in many situations but bad in others. The Nordics of Greenland, for example, have remained united in this difficult environment for four and a half centuries by a common commitment to religion and strong social cohesion. But these two things - religious devotion and strong social cohesion - also ultimately made it difficult for them to change and learn from the Inuit. Or today, Australia.

One of the things that allowed Australia to survive for 250 years on this frontier of European civilization was its British identity.

Today, however, their preoccupation with their British identity does little for Australians who need to adapt to Asian conditions. So it's especially hard to turn around when what's getting you into trouble is also the source of your strength.

What will the result be today?

Now, we all know of dozens of time bombs happening in the modern world, time bombs with fuzes lasting decades, but they are all 50 years or less, and any one of them can affect us. They list about a dozen, including time bombs such as water, soil, climate change, alien species, photosynthetic limits, population problems, and toxic substances. And none of these time bombs have fuzes longer than 50 years, most have fuzes of decades, but in some places they have much shorter fuzes. At the current pace, the Philippines will lose all accessible logging forests within five years. And the Solomon Islands have just a year to go before they lose their main export of harvestable forests. And that would be great for Solomon's economy. Jared, people ask me a lot. What is the most important thing we must do regarding global environmental issues?

And my answer is to forget that the most important thing we have to do is not the single most important thing we have to do.

Instead, there are many things, any one of which could be useful to us.

And we have to get them all right. Solving 11 causes a problem because 12 can no longer be resolved. For example, if we solve the water, soil, and population problems, but not the toxics problem, we face a problem.

In fact, our current course is an unsustainable course, which by definition means we cannot sustain it.

And the consequences will be resolved within decades.

So those of us in this room under the age of 50 or 60 will know how these contradictions are resolved. Those of us over 60 may not see the solution, but our children and grandchildren will.

This solution will achieve one of two forms. That is, either we resolve these unsustainable confluences of time in a comfortable way of our choosing, by taking corrective action, or else these conflicts will be resolved by an uncomfortable way not of our choosing: war, disease, or starvation. But what is certain is that our unsustainable trajectory will be resolved in some way within decades. So, since the theme of this session is choice, we have a choice. Does that mean we should be pessimistic and overwhelmed? I draw the opposite conclusion.

The big problems facing the world today are by no means out of our control. Our greatest threat isn't an asteroid about to hit us that we can't do anything about.

Rather, all of the major threats we face today are problems of our own creation. And since we created the problem, we can also solve it. In other words, it is entirely in our power to address these issues.

In particular, what can we all do? For those interested in these choices, there are many things you can do. There are many things we do not understand and need to understand. And there are a lot of things that we already understand but don't and need to do. thank you.

(applause)

I grew up in Europe and was involved in World War II when I was 7-10 years old.

I also realized how few adults I know were able to withstand the tragedy that war had inflicted on them, how few were able to lead normal, contented, happy lives after their jobs, homes and security were devastated by war.

So I became interested in understanding what contributes to a life worth living.

And as a child, as a teenager, I read philosophy and tried to get involved in art and religion and many other ways that I thought might be the answer to that question.

And finally, by chance, I stumbled upon psychology.

The snow had melted and I had no money to go see a movie, so I was in a ski resort in Switzerland with no money to actually enjoy myself. But I read in the newspaper that there was someone's presentation at a place I'd seen in the center of Zurich, and what he was going to talk about was about flying saucers.

Since I can't go to the movies, I decided to at least go and listen to the flying saucers for free.

And the man I spoke to in the lecture that night was very interesting.

Instead of talking about little green men, he talked about how European minds were so traumatized by the war that they now project flying saucers into the sky.

He talked about how ancient Hindu mandalas were projected into the sky in an attempt to restore a sense of order after the chaos of war.

And this seemed very interesting to me.

And after that lecture, I started reading his book.

That was Carl Jung, and I didn't know his name or his work at all.

Then I came to this country to study psychology and started trying to understand the roots of happiness.

This is a typical result presented by many, and there are many variations on this.

But this shows, for example, that about 30 percent of people surveyed in the United States since 1956 say they are very happy with their lives.

And it hasn't changed at all.

Meanwhile, personal income, which was held at a constant size to accommodate inflation, more than doubled and almost tripled during this period.

But you get essentially the same result. That is, beyond a certain base point (corresponding to more or less a few thousand dollars above the minimum poverty level), increases in material well-being do not seem to affect people's well-being.

In fact, we find that a lack of basic or material resources contributes to unhappiness, but an increase in material resources does not increase happiness.

So my research sought to understand after discovering these things that actually matched my own experience. Where in our daily lives, in our ordinary experiences, do we feel truly happy?

To begin these studies some 40 years ago, I looked to creative people—the first artists, scientists, etc.—to try to understand what made many of them feel that, while they did not expect fame or fortune, their lives were inherently worth spending on making life meaningful and rewarding.

He was one of the leading composers of American music in the 70's.

And the interview was 40 pages long.

But this small excerpt is a very good summary of what he said during the interview.

And it describes the feeling when the composition is progressing smoothly.

And he describes it as a state of ecstasy.

Now, the Greek word "ecstasy" simply meant to stand by something.

And it essentially became a metaphor for the mental state of not feeling like you're living a normal day-to-day life.

So ecstasy is essentially taking a step into an alternate reality.

And when you think about it, it's interesting that when we think of the civilizations we revere as the pinnacle of human achievement, be it the Chinese, the Greeks, the Hindus, the Mayans, the Egyptians, etc., what we know about them is really about their ecstasy, not their everyday life.

We know the temples they built for people to experience different realities.

We know circuses, arenas and theaters.

These are the remnants of civilizations, places people have visited to experience life in a more focused and orderly way.

Well this guy doesn't have to go to a place like this, it's also a place of ecstasy, this place, this arena built like a Greek amphitheater.

We are participating in a reality that is different from the familiar everyday life.

But this person doesn't need to go there.

All he needs is a piece of paper to write down a small mark so he can imagine a sound that never existed before with that particular combination.

So when he reaches a point where he begins to create a new reality, a moment of ecstasy, as Jennifer improvised, he enters that different reality.

Now, he also says it's been such an intense experience that he feels like he doesn't exist.

It sounds like a kind of romantic hyperbole.

But in reality, our nervous system can't process more than about 110 bits of information per second.

It takes about 60 bits per second to hear me and understand what I'm saying.

So you can't hear more than two voices.

It cannot understand what more than two people are talking about.

Now, when you're as serious as this man about the utterly fascinating process of creating something new, you don't have enough attention left to monitor your bodily sensations and domestic problems.

I don't even feel hungry or tired.

His body disappears and his identity disappears from his consciousness. Because, like all of us, he gets really good at something that requires a lot of focus and at the same time doesn't have enough attention to feel like he exists.

Existence is therefore temporarily suspended.

And the hand seems to move on its own, he says.

Now, I can look at my hands for two weeks and not feel any awe or surprise because I can't compose. (Laughter) What I'm trying to say here is that, obviously, this automatic, spontaneous process he's describing can only happen to very well-trained and well-developed people.

And it's become a kind of truism in creativity research that you can't produce anything without devoting less than 10 years of technical knowledge to a particular field.

It takes that long to start changing something for the better, whether it's math or music.

Now, when that happens, the music will flow, he says.

And everyone I started interviewing with, this was an interview over 30 years ago. So many people have described this as spontaneous flow, which is why I called this type of experience a "flow experience."

And it happens in different areas.

For example, one poet put it this way:

This is according to my students who have interviewed several of the leading American writers and poets.

And it represents the same effortless, spontaneous feeling that you get when you enter this state of ecstasy.

The poet describes it as opening a door in the sky. This is very similar to what Albert Einstein said about how he imagined relativity when he was struggling to understand how it worked.

But it happens in other activities too.

For example, this is another student of mine, Susan Jackson from Australia. He has worked with some of the world's top athletes.

And in this depiction of the Olympic skater we see the same essential depiction of the inner phenomenology of man.

you don't think Blend yourself with the music and it will happen automatically.

In fact, this is what happened in my recent book, Good Business. There, I interviewed several CEOs who had been named by their peers as being highly successful, highly ethical and socially responsible.

We find that these people define success as something that helps others while also making them feel happy to be working on it.

And as all of these successful and responsible CEOs have said, if you want to do meaningful and successful work, you can't do just one of these things.

Anita Roddick is also one of the CEOs we interviewed.

She is the king of natural cosmetics and the founder of The Body Shop.

It's like the passion that comes from doing your best and having flow while you work.

Here is an interesting little quote from Masaru Ibuka. He started Sony with no money and no products at the time. They didn't have a product or anything, but they had an idea.

He also wanted to create a workplace where engineers could feel the joy of technological innovation, be aware of their mission to society, and work to their heart's content.

A good example of how flow comes into the workplace, this couldn't have been better.

Now, in our research, along with other colleagues around the world, we have conducted over 8,000 interviews with people who enjoy their work, from Dominican priests to blind nuns to Himalayan climbers to Navajo shepherds.

And regardless of culture, education, etc., there are these seven conditions that seem to exist when a person is in a state of flow.

This concentration, once strong, leads to a feeling of ecstasy and clarity. From one moment to the next, you know exactly what you want. Get immediate feedback.

Even if it is difficult, the things to be done turn out to be doable, and we lose track of time, forget ourselves, and feel part of something greater.

And once the conditions are right, what you're doing becomes worthwhile in and of itself.

In our research, we describe people's daily lives in this simple diagram.

In fact, we can measure this very precisely because we give people an electronic pager that rings 10 times a day, and every time it rings, it tells them what they are doing, how they are feeling, where they are, and what they are thinking.

And the two things we measure are the amount of challenge people experience in that moment and the amount of skill they feel they have in that moment.

Therefore, for each person, we can establish an average value that is the center of the chart.

That's your average level of challenge and skill, unlike anyone else.

But there's some sort of setpoint there that goes in between.

Knowing that setting, you can predict with a fair degree of accuracy when you will enter the flow state. That's when challenges are above average and skills are above average.

And while you may be doing something completely different than everyone else, for everyone, that flow channel, that area, becomes when you're doing what you really want to do -- playing the piano, being with your best friend, maybe work (if work is what gives you flow).

And other areas become less and less positive.

Arousal is still good because it's overly challenging there.

Your skills aren't as high as they should be, but with a little more skill you can move into flow fairly easily.

So Awareness is the domain most people learn from. Because arousal is where a person is pushed out of their comfort zone, into it and back into the flow to become more skilled.

It's also a good place to control. Because even though it's comfortable there, it's not very exciting.

It's not that hard anymore.

And if you want to go from control to flow, you need to increase your challenges.

These two are therefore ideal, complementary areas that flow easily into.

Other combinations of challenge and skill become progressively less optimal.

It's okay to relax. I still feel okay.

Boredom becomes very repulsive and indifference becomes very negative. I don't feel like I'm doing anything, I don't use my skills, I don't have any challenges.

Unfortunately, many people's experiences are indifferent.

Television viewing contributes most to that experience. Next is sitting on the toilet.

You can be in a flow state 7-8 percent of the time you watch TV, but then you can choose the shows you really want to watch and get feedback from there.

So the question we're trying to address is, time has passed, how can we channel more of our daily lives into that flow?

And that is the problem we are trying to understand.

And while some know how to do it spontaneously without advice, many unfortunately don't.

And that, in a way, is our mission.

thank you.

(applause)

Why are transgender people suddenly popping up everywhere?

(Laughter) As a trans activist, I get this question a lot.

Keep in mind that less than 1 percent of American adults openly identify as transgender.

According to a recent GLAAD survey, about 16 percent of non-trans Americans claim to know a transgender person in real life.

So for the remaining 84%, this may seem like a new topic.

But transgender people are nothing new.

Gender differences have been around for longer than you might think, and transgender people are part of that legacy.

From Central Africa to South America to the Pacific Islands and beyond, there are people who perceive multiple genders, and they've been around for a long time.

For example, the Hijras of India and Pakistan are cited in the Kama Sutra as far back as 2,000 years ago.

Each Native American nation has its own terminology, but most share the overarching term "two spirits."

They viewed gender-variant people as shamans and healers in their communities, but it was only with the spread of colonialism that they were taught to think otherwise.

Now, in researching trans history, we look for both trans people and transgender practices.

For example, consider the women who showed up as men to fight in the Civil War.

After the war, most resumed their lives as women, but some, like Albert Cashier, continued as men.

Albert was eventually confined to a mental institution and forced to wear a dress for the rest of his life.

(sigh) Around 1895, a group of self-proclaimed androgynous people formed the Cercle Hermaphroditus.

Their mission was to unite to protect against the world's fierce persecution.

And in doing so, they became one of the earliest transgender support groups.

By the 40's and 50's, medical researchers began to study trans medicine, aided by trans patients such as Louise Lawrence, a trans woman who corresponded extensively with those arrested for cross-dressing in public.

She introduced sexual researchers like Alfred Kinsey to a large trance network.

Other early figures followed, including Virginia Prince, Reed Erickson, and the famous Christine Jorgensen, who made headlines for her public sex change in 1952.

But while white trans people living in the suburbs have created their own support networks, many trans people of color have had to forge their own path.

Some, like Major Griffin Gracie, walked in drag balls.

Others, so-called "street queens," were often targeted by police for their gender expression and were at the forefront of influential events in the LGBT rights movement.

It reminds me of the 1959 Cooper Donuts, the 1966 Compton's Cafeteria, and the famous 1969 Stonewall Inn riot.

In 1970, Stonewall veterans Sylvia Rivera and Marsha P. Johnson founded STAR: Street Transvestite Action Revolutionaries.

Transgender people continued to fight for equal treatment under the law in the face of rising discrimination rates, unemployment, arrests and a looming AIDS epidemic.

Since our existence, those in power have tried to disenfranchise transgender people who dare to live their lives.

Filmed in Berlin in 1933, the film is sometimes used in history textbooks to explain how the Nazis burned works they deemed un-German.

But what is rarely mentioned is that this vast pile contains the works of the Institute of Sexual Sciences.

You see, I reviewed the transgender movement in America, but Magnus Hirschfeld and his colleagues in Germany put us decades ahead.

Magnus Hirschfeld was an early advocate for LGBT people.

He wrote the first book's worth of documentation about transgender people.

He helped them obtain medical services and identification.

He worked with the Berlin police to desegregate LGBT people and hired them into the institute.

So when the Nazi Party burned down his library, it had a devastating effect on trans research around the world.

This was a deliberate attempt to erase transgender people, and it was neither the first nor the last.

So whenever people ask me why trans people are suddenly popping up all over the place, I just want to say we're here.

These stories must be told along with countless other stories that have been buried over time.

Not only have our lives not been celebrated, but our struggles have also been forgotten, which makes trans issues feel new to some.

Today I meet many people who think our movement is just one step away, but I also hear well-meaning allies telling us all to be patient because our movement is “still new.”

Imagine how the conversation would change if we acknowledged how long transgender people have demanded equality.

Are we still overreacting?

Should I keep waiting?

Or, for example, should we do something about trans women of color who are murdered and whose killers never get justice?

Do you still think our situation is dire?

(sighs) Finally, I want other transgender people to understand that they are not alone.

I grew up thinking that my identity was abnormal and that it died with me.

People had this idea of ​​otherness hammered into my mind, but I didn't know anyone else like me, so I bought this book.

Perhaps if I had known my ancestry sooner, it wouldn't have taken me so long to find a source of pride in my identity and my community.

Because I belong to an amazingly vibrant community of people who lift each other up when others don't, care for each other even when they're struggling, and somehow still celebrate and love each other and find reasons to look them in the eye and say, "You're not alone."

you have us

Besides, we're not going anywhere. ”

thank you.

(applause)

A shooting star crashes into the earth, revealing a terrifying mass.

It crawls and jumps, slips and slides.

Nor can it be stopped by weapons, fire, or extreme temperatures. No matter what you throw at it, it just plays and keeps rampaging.

Its expansion is breathtaking. It doubles in size every hour.

But there is one chance. That is, every hour they go to sleep, form a flat triangle, rest for a few minutes, and then start feeding and growing again.

The only chance to save the planet involves satellite-borne nano-fission rays slicing through the mass.

If your blog is active, it will be automatically repaired within seconds.

But breaking the sleeping blob into two triangles yields an important discovery.

Areas of acute triangles where all angles are less than 90 degrees are inert.

It never "wakes up". An obtuse triangle with an angle greater than 90 degrees wakes up and continues to grow as usual.

Similar experiments have shown that it also launches all shapes other than acute triangles, including right triangles.

For the next few minutes, the mass sleeps in the form of an obtuse triangle.

You can cut a clean straight line between any two points on or within a triangle.

However, you only have 7 cuts while the satellite is in the sky.

Even if there was even one piece left to wake up, the mass would have engulfed the entire world by the time it completed its orbit and returned.

How can we cut the chunks into perfectly sharp triangles and prevent them from destroying the Earth?

Pause the video now and find out for yourself. Please answer with 3. Please answer with 2. Please answer with 1. While this seems doable at first, there are hidden difficulties when it comes to avoiding obtuse and right angles.

Each cut that reaches an edge creates an acute angle and an obtuse angle, or two right angles.

So it seems doomed to keep making obtuse angles.

But like many things in life, we can look to pizza for inspiration.

Imagine making the outside of your pizza square so it's an octagon instead of a circle.

When sliced, each of the eight triangles has an acute angle.

This works even with large polygons.

Importantly, it also works for some polygons with few sides, such as heptagons, hexagons, and pentagons.

This is good news. Because if you cut off the sharp corners of the blob triangle, you're left with exactly the pentagon.

Like a pizza, you can cut a pentagon block into 5 sharp triangles.

This is 7 cuts and the blob is completely inert.

Saved me from a predicament!

Now all we need to do is figure out what to do with all those giant, virtually indestructible triangles.

In 2004, a new company called Vemma Nutrition began offering life-changing opportunities to earn a full-time income with a part-time job.

Vema's offer was open to anyone, regardless of previous experience or education.

Only two steps are required to earn income. Purchase a $500-600 kit of liquid nutrition products and recruit two more members to do the same.

Vemma Nutrition Company grew rapidly, becoming a global operating company with 30,000 new members per month at its peak.

There was just one problem. By 2013, the company was making $200 million in annual revenue, but the majority of participants were earning less than they paid.

Vema was eventually charged with running a pyramid scheme. This is a common type of scam where members make money by soliciting supporters.

The founders usually solicit the first group to join them in promoting this plan.

They are then encouraged to hire others, pledge a portion of the funds they invest, and the founders also receive a cut.

This pattern is repeated for each new group of participants, with funds from those who have recently arrived funneled into those who recruited them.

This is different from Ponzi schemes where founders recruit new members and covertly use them to pay existing members who believe the payout is a legitimate investment.

As the pyramid scheme expands, it becomes more and more difficult for new recruits to make money.

This is because the number of participants increases exponentially.

Consider a structure where each person needs to employ 6 more people to make a profit.

The founders initially hire 6 people, each of whom hires 6 more.

There were 36 recruits in the second round, followed by 6 recruits each, for a total of 216 new hires.

By the 12th recruitment, the 2.1 billion newest members will need to recruit more than 13 billion people in total to generate revenue, which is more than the entire world population.

In this scenario, recent recruits, or more than 80% of scheme participants, lose all the money they paid.

And in real life, many of the early participants also lost out.

Ponzi schemes are illegal in most countries, but can be difficult to spot.

It is introduced as a gift group, investment club, multi-level marketing, etc.

The distinction between pyramid schemes and legitimate multi-level marketing can be particularly blurry.

The theoretical difference is that members of a multi-level marketing firm are primarily rewarded for selling specific products and services to retail customers, whereas pyramid schemes primarily reward members by recruiting new sellers.

In practice, however, many MLM companies make it nearly impossible for members to make a profit from sales alone.

Also, many pyramid schemes like Vemma Nutrition disguise themselves as legitimate multi-level marketing businesses by using their products and services to hide their reward and recruitment structures.

Many pyramid schemes take advantage of existing trusts within churches, immigrant communities, or other close-knit groups.

The first few members are encouraged to report good experiences before they start making real profits.

Other companies within their network follow their example, and the scale of the scheme balloons before it becomes clear that most members are not actually making a profit.

Victims are often confused and silent.

Ponzi schemes lure people with promises of opportunity and power.

So when members don't make money in the end, they can blame themselves rather than the plan, thinking they weren't tenacious enough to get the promised benefits.

Some victims continue to challenge themselves by investing in multiple schemes and lose money each time.

Despite all these factors, there are ways to spot a pyramid scheme.

Time pressure is one of the red flags. Beware of instructions that say, "If you don't act now, you'll miss out on a once-in-a-lifetime opportunity." The promise of high, life-altering income is also questionable.

And finally, no legitimate multi-level marketing business should require members to pay for the opportunity to sell products or services.

Ponzi schemes can have incredibly devastating effects on individuals, communities, and even entire nations.

But if you send this video to three people you know and encourage them to do the same, you can fight fire with fire.

I was six years old when I first had the opportunity to learn the meaning of patience.

My grandmother gave me a magic box as a birthday present, but neither of us knew it would be a gift of a lifetime.

I fell in love with magic and became an amateur pigeon magician at the age of 20.

To perform this magical act, pigeons must be trained to sit and wait inside their clothes.

As a young magician, I was always in a hurry to make doves appear, and my teacher told me that the secret to success in this magical act was to put on a tuxedo and wait patiently before making the doves appear.

It has to be mindful patience and it took me years to master it.

When I went to Shanghai seven years ago, it became almost impossible to practice the mindful perseverance I had learned.

In China, where everyone is in a rush, building a better life requires outperforming the other 1.3 billion people.

Hack systems, bend the rules, and circumvent boundaries.

It's the same with food...

However, impatientness can have disastrous consequences when it comes to food.

In a rush to grow more and sell more, overuse of chemicals and pesticides has ruined 4,000 years of agriculture in this country of natural resources.

In 2016, the Chinese government disclosed 500,000 food safety violations in just nine months.

Surprisingly, one in four diabetics in the world now come from China.

The stories about food are terrifying and a little overwhelming. I told myself it was time to bring discreet patience into the impatience.

When I say mindful patience, I do not mean the ability to wait.

This means that you know how to act while you wait.

So, while waiting for a sustainable food system to become a reality in China, I launched China's first online farmer's market to bring local, organic produce to families.

When we started playing live 18 months ago, the food we could sell at the time was somewhat dire.

Few fruits and meats were available for sale because nothing sent to the lab passed the zero-tolerance test for pesticides, chemicals, antibiotics and hormones.

I told a very concerned employee that I would not give up until I met all the local farmers in China.

Currently, we supply 240 types of agricultural products from 57 local farmers.

After nearly a year of searching, we finally found a pesticide-free banana grown in a villager's backyard on Hainan Island.

And just two hours from Shanghai, on an island with no coordinates on Google Maps, I found a place where cows graze and roam freely under blue skies.

We are also focusing on logistics.

We deliver your order by electric vehicle in as little as 3 hours and use biodegradable and reusable boxes to minimize our environmental footprint.

I have no doubt that our service will continue to grow, but it will take time. And we know it takes even more people to shape the future of good food.

So last year, I founded China's first food tech accelerator and VC platform to help start-ups shape the future of good food the way they want, whether it's using edible insects as a more sustainable source of protein or using essential oils to keep food fresher longer.

So you may still be wondering: Why are you promoting a patient movement and trying to build a sustainable food system in a country where slowing down is almost a crime?

Because for me, the real secret to success is patience. It's the mindful kind of patience that requires knowing how to act while waiting, the kind of patience I learned in my grandmother's magic box.

After all, we did not inherit the earth from our ancestors.

We borrow from our children.

thank you.

(applause)

Reaching over 100 meters tall, California sequoias tower above an estimated 60,000 species of trees on the planet.

Growing in the misty Sierra Nevada mountains, its massive trunk supports the world's tallest known tree.

But even these giants seem to have their limits.

On record, sequoias cannot grow above 130 meters, and many researchers say these trees won't exceed that limit even in the next few thousand years.

So what is it that keeps these trees from growing taller forever?

Everything comes down to sap.

In order for a tree to grow, it is necessary to transport the sugars obtained through photosynthesis and the nutrients taken in from the root system to where the growth is taking place.

And just like blood circulates in the human body, trees are designed to circulate two types of sap throughout the body, carrying all the substances the tree cells need to live.

The first is the phloem sap.

The sugar-laden phloem sap produced in the leaves during photosynthesis is thick, like honey, and flows down the plant's phloem tissue to distribute sugars throughout the tree.

By the end of the journey, the phloem sap thins into a watery substance that pools at the base of the tree.

Right next to the phloem is another tissue type of the tree, the xylem.

This tissue is packed with nutrients and ions such as calcium, potassium, and iron that the tree has absorbed from its roots.

Here at the base of the tree, there are more of these particles in one tissue than in the other, so water from the phloem sap is absorbed by the xylem to correct the balance.

This process, called osmosis, produces a nutrient-rich xylem sap that travels up the trunk and spreads nutrients throughout the tree.

But this journey faces a formidable obstacle: gravity.

To accomplish this formidable task, the xylem relies on three forces: transpiration, capillary action, and root pressure.

As part of photosynthesis, leaves open and close pores called stomata.

These openings allow oxygen and carbon dioxide to enter and leave the leaves, but also create openings for water to evaporate.

This evaporation, called transpiration, creates a negative pressure in the xylem and draws the water-like xylem sap up the tree.

This attraction is facilitated by a fundamental property of water called capillary action.

In narrow tubes, the attractive forces between water molecules and the adhesive forces between water and its environment can overcome gravity.

This capillary action works best with xylem filaments thinner than a human hair.

And where these two forces pull the sap, the osmotic movement at the base of the tree creates root pressure, pushing fresh xylem sap up the trunk.

Together, these forces expel sap to dizzying heights to distribute nutrients and grow new leaves far above the base of the tree for photosynthesis.

But despite these sophisticated systems, every centimeter is a battle against gravity.

As trees grow taller and taller, their supplies of these vital liquids begin to diminish.

At a certain height, trees can no longer make up for the water lost to evaporation during photosynthesis.

And without the photosynthesis needed to support additional growth, the tree directs its resources to existing branches instead.

This model, known as the 'Hydraulic Limit Hypothesis', is currently the best explanation for why trees are limited in height even in perfect growing conditions.

And using this model in conjunction with growth rates and known nutrient and photosynthetic needs, researchers were able to propose height limits for specific species.

So far, these limits have been maintained, and even the world's tallest trees still drop about 15 meters below their caps.

Researchers are still investigating possible explanations for this limitation, but there may be more than one universal reason why trees stop growing.

But until we learn more, tree height is literally just another way gravity shapes life on Earth.

In 1925, Frida Kahlo was on her way home from school in Mexico City when her bus collided with a streetcar.

She suffered near-fatal injuries to her spine, pelvis, and hip joints, and was bedridden for months afterwards.

During her recovery, she had a special easel attached to her bed so she could practice her drawing skills.

Once she started working, she began to paint the world according to her own vision.

Throughout her life, she established herself as a creator and muse of extraordinary art.

You may have met Kahlo's gaze, but her work offers an opportunity to see the world through her eyes.

She painted friends and family, still lifes, and spiritual scenes. But it was her mesmerizing self-portrait that first caught the world's attention.

An early work, Self-Portrait in a Velvet Dress, highlights her strong eyebrows, beard, long neck and formidable gaze.

Such traits remained, but Kahlo soon began to express herself in more unusual ways.

For example, "The Broken Column" uses symbolism, religious imagery, and destroyed landscapes to reveal her physical and mental state.

In 1928, Kahlo began dating fellow painter Diego Rivera.

They became lifelong partners and developed an eccentric celebrity.

Together they traveled the world and devoted themselves to the arts, communist politics and Mexican nationalism.

Kahlo and Rivera had a deep affinity for the Mexican Idad, a movement that celebrated post-revolutionary indigenous cultures.

In everyday life, Kahlo wore traditional Tehuana costumes and immersed herself in indigenous spirituality.

And in her work she always referenced Mexican folk paintings, incorporating their vivid colors and references to death, religion and nature.

With images of giant floating flowers, rippling landscapes, transplanted body parts, and billowing devil clouds, Kahlo has often been associated with Surrealism.

But whereas the surrealists used dreamlike imagery to explore the unconscious mind, Kahlo used them to represent her physical body and life experiences.

Two of her most explored experiences were disability and marriage.

As a result of the bus accident, she experienced lifelong health complications and was hospitalized multiple times.

She often pondered the physical and psychological effects of disability on the job. I paint myself in pain, recovering from surgery, or objects such as hip braces and wheelchairs.

Meanwhile, his relationship with Rivera was a stormy one, marked by infidelity on both sides.

They were divorced for a while, but remarried a year later.

During this period, she painted The Two Fridas, a double self-portrait that speaks of the agony of loss and a split self-consciousness.

Frida on the left is heartbroken and has blood dripping down her old Victorian dress.

She symbolizes an artist who has been wounded in the past, but is at the same time connected to her second self by an artery.

This Frida is dressed in Tehuana costume and remembers Diego with a small portrait in her hand, but her heart is still intact.

Together, they suggest a position caught between past and present, individuality and dependence.

Kahlo died in 1954 at the age of 47.

Her popularity skyrocketed in the years after her death, and it continues to this day.

Her image has gone viral, but Kahlo's body of work reminds us that there are no simple truths about the life, work, and legacy of the woman behind this icon.

Rather, she exhibited multiple versions of her reality and offered us some gateways into the contents of her soul.

"All I wanted was a well-deserved promotion, and he said to me, 'Stand on your desk and spread it out,'" she said. "All the men in my office wrote down on a piece of paper the sexual favors I could do for them.

All I wanted was an office with windows. ”

"I asked for advice on how to get the bill out of the committee and he asked if he would bring kneepads."

These are just some of the horror stories I've heard from women over the last year as I research sexual harassment in the workplace.

And what it turns out is that it's trending all over the world.

It's a scary reality for millions of women who only want to go to work every day.

Sexual harassment is not discrimination.

You can wear skirts, hospital scrubs, and military uniforms.

You can be young or old, married or single, black or white.

It doesn't matter if you're a Republican, a Democrat, or an independent.

I've heard from police officers, military personnel, financial assistants, actors, engineers, lawyers, bankers, accountants, teachers and many more.

journalists.

It turns out that sexual harassment is not about sex.

It's about power and what someone will do to you in an attempt to take your power away.

And I am here today to let you know that you can take back that power.

(Applause.) On July 6, 2016, I jumped off a cliff by myself.

It was the scariest moment of my life. intolerable choice.

I was alone in the abyss, not knowing what lay beneath.

But then miraculous things began to happen.

Thousands of women contacted me and began sharing their experiences of pain, suffering and shame.

They told me I was their voice, they had no voice.

And suddenly I realized that even in the 21st century, every woman still has a story.

Like Joyce, the flight attendant boss would tell her about the porn he had seen the night before in his daily meetings, drawing a picture of his penis on a notepad.

she went to complain.

She was called "crazy" and fired.

Like Joan of Wall Street Banker.

Her male colleagues used to call her that vulgar word every day.

She complained—that she would be labeled a troublemaker and never do business with Wall Street again.

An army officer like Elizabeth.

Male subordinates would wave $1 bills in her face and say, "Dance for me!"

And when she went to complain to the Major, he said, "Huh? Only a dollar?"

You deserve at least 5 or 10! ”

As I read these emails, replied to them all, and cried, I realized that I had a lot of work to do.

Here are some amazing facts. As far as we know, 1 in 3 women are sexually harassed at work.

71% of those incidences are never reported.

why?

Because when women come forward, they are still called liars and troublemakers, demeaned, defamed, demoted, blacklisted and fired.

Reporting sexual harassment can often be career-ending.

Of all the women who have contacted me, very few are still working in their chosen profession. This is outrageous.

I was silent at first too.

It happened to me at the end of my year as Miss America, when I was meeting in New York City with a very high-ranking executive at a television station.

He called me a lot all day and I thought he was helping me.

We went to dinner and in the back seat of the car he suddenly pounced on me and stuck his tongue down my throat.

I didn't know he was going to get in my pants to "get in business". I'm stupid

And just a week later, when I was meeting with a senior publicist in Los Angeles, the same thing happened again.

in the car again.

And he grabbed my neck with his hands and pushed my head so hard into my crotch that I couldn't breathe.

These events suck all your confidence.

These are events that, until recently, weren't even called assaults to me.

That's why we have so much work to do.

After completing my year as Miss America, I continued to meet many famous people, including Donald Trump.

In 1988, when this photo was taken, no one could have predicted where we are today.

(Laughter) I'm fighting to end sexual harassment in the workplace. Nevertheless, he is the President of the United States.

Soon after, I landed my first TV news job in Richmond, Virginia.

Check out that confident smile in a bright pink jacket.

Hair not so much.

(Laughter) I was working hard to prove that blondes have a lot of brains.

But ironically, one of the first articles I covered was the Anita Hill hearing in Washington, DC.

Shortly after that, I was also sexually harassed at work.

I was in rural Virginia doing research, and when I got back to my car and the cameraman touched me on the mic, I touched my chest and started talking, wondering how much I enjoyed it.

And it went downhill from there.

I was leaning against the passenger door. This was before mobile phones.

I have become petrified.

In fact, I thought how painful it would be to imagine myself tumbling out the door while the car was going 80 miles an hour like in the movies.

The allegations were terrifying when stories about Hollywood's most famous movie mogul, Harvey Weinstein, came to light.

But with so many women coming forward, I realized what I was doing meant something.

(Applause) He gave a very lame excuse.

He said he was a product of the 60's and 70's and that was the culture of the time.

Well, that was the culture then, and unfortunately it still is.

why?

There are still many myths about sexual harassment.

“Women should get another job and find another career.”

Yes, that's right.

Tell that to single moms who are trying to make ends meet by working two jobs and are being sexually harassed.

"Women are causing it themselves."

By the clothes and make-up we wear.

Well, I think the hoodies worn by Uber engineers in Silicon Valley are very provocative.

"Women make up for it."

Yes, because being put down and put down is so much fun and rewarding.

I would know

“Women bring up these claims because they want to be famous and rich.”

My boss said so too.

Taylor Swift, one of the most famous and richest singers in the world, probably didn't need more money or fame when she came forward with a $1 molestation lawsuit.

And I'm really happy that she did.

Latest news: The untold story of women and sexual harassment in the workplace: Women just want a safe, welcoming and harassment-free environment.

that's it.

(Applause.) So how can we regain power?

There are three solutions.

First, we need to turn bystanders and enablers into allies.

Currently, 98% of US companies have sexual harassment training policies in place.

70% have a prevention program in place.

However, overwhelmingly bystanders and witnesses do not come forward.

In 2016, the Harvard Business Review called this the "bystander effect."

Still, remember 9/11.

We've heard the phrase "if you see something, say something" a million times.

Imagine the impact it would have if people on the sidelines of sexual harassment at work were told to recognize and stop sexual harassment from occurring. To confront the perpetrator face to face. to help and protect victims.

This is my cry to men. We need you in this battle.

And for women, too, they are an alliance enabler.

Second, change the law.

How many people know if their employment contract has a mandatory arbitration clause?

I don't have many hands.

If you don't know, you should know. Here's why.

Time magazine calls it "the tiny little letters in the contract that keep sexual harassment allegations going unheeded" on screen.

It is:

Mandatory arbitration removes Seventh Amendment rights to an open jury process.

that's a secret.

You won't get the same witnesses or depositions.

In many cases, the company selects the arbitrator.

There are no appeals and the employee has only a 20% chance of winning.

But again, it's a secret, so no one knows what happened to you.

This is why I have worked so hard in the Capitol in Washington DC to change the law.

And I want to say to senators, sexual harassment is irrelevant to politics.

No one asks if you're a Republican or Democrat first before they harass you.

they just do it.

That's why we should all care.

Third, be fierce.

It starts with us standing tall and building confidence.

And we will stand up and speak up and tell the world what happened to us.

I know it's scary, but let's do it for the kids.

Let's stop doing this for the sake of the next generation.

I know I did it for my children.

They were paramount in my decision-making about whether I would come forward.

My beautiful children, 12 year old son Christian and 14 year old daughter Kaia.

And didn't I underestimate them?

The first day of school last year happened to be the day I announced my decision, so I was very worried about what they would do.

My daughter came home from school and said, "Mommy, a lot of people asked me what happened to you over the summer."

Then she looked me in the eye and said, "And Mom, I'm so proud you were my mom."

And two weeks later, when she finally found the courage to stand up to the two children who were making her life miserable, she came back to me and said,

(Applause.) You see, the gift of courage is contagious.

And I hope my journey inspires you, because now is the tipping point.

We are watching history happen.

More and more women are saying, "Enough is enough."

(Applause) This is my final request to companies.

Let's rehire all the women who lost their careers because of haphazard decisions.

Because this is what I know about women. We are no longer underestimated, intimidated, or set back. We will not be silenced by the regime's ways or relics of the past.

no.

We stand up and speak up and make our voices heard.

We become the women we are meant to be.

And most of all, we will always remain fierce.

thank you.

(applause)

What if you could sleep more efficiently?

As a sleep scientist, this is a question that has fascinated me for the past decade.

Because light bulbs and technology have brought about a world of 24-hour work and productivity, but at the cost of our naturally occurring circadian rhythms and our bodies' sleep demands.

Circadian rhythms determine our energy levels throughout the day. Just recently, we conducted a global experiment on this rhythm that is putting our sleep health and, ultimately, our quality of life at risk.

Because of this, we're not getting the sleep we need, and the average American sleeps a whole hour less than they did in the 1940s.

For some reason, we decided to wear it as a badge of honor for being able to live with sleep deprivation.

All of this adds up to create a real health crisis.

Most of us know that lack of sleep is linked to diseases such as Alzheimer's, cardiovascular disease, stroke and diabetes.

Also, leaving sleep disorders such as sleep apnea untreated increases the chances of developing many of these disorders.

But did you know how sleep affects your mental state?

Lack of sleep causes us to make risky and hasty decisions and drains our capacity for empathy.

If sleep deprivation literally makes you more sensitive to your own pain, it shouldn't be too surprising that sleep deprivation makes it harder for you to relate to others and generally keep you a good, healthy person.

Scientists are now beginning to understand how not only the quantity but also the quality of sleep affects our health and well-being.

My research focuses on deep sleep, which many scientists believe is the most regenerative stage of sleep.

In general, we know that there are three stages of sleep. They are light sleep, rapid eye movement or REM sleep, and deep sleep.

Electrodes are attached to the scalp, chin, and chest to measure these stages.

EEGs during light sleep and REM sleep are very similar to those during waking hours.

However, the EEG during deep sleep has long bursts of EEG that differ significantly from the EEG during wakefulness.

These long bursts of brain waves are called delta waves.

When you don't get the deep sleep you need, your ability to learn and your cells and body to recover is hampered.

Deep sleep is how we translate all the interactions we have during the day into long-term memory and personality.

As we age, we are more likely to lose these regenerative delta waves.

So deep sleep and delta waves are actually indicators of biological youth.

Naturally, I wanted to get more deep sleep for myself, and literally tried almost every gadget, gizmo, device, and hack out there, consumer grade, clinical grade, and more.

I've learned a lot and, like most people, I find that I really need 8 hours of sleep.

I've tried altering my circadian rhythm by changing my diet, exercising, and getting some light, but I still haven't found a way to get a deeper night's sleep...

Until I met Dr. Dmitry Gerashchenko at Harvard Medical School.

Dmitry told me about a new finding in the literature where a German lab showed that if people could play certain sounds at the right times while they were asleep, they could actually make their sleep deeper and more efficient.

What's more, the lab showed that using this sound could actually improve your memory the next day.

Dmitry and I teamed up and started working on how to build this technology.

I worked with collaborators in the Pennsylvania State University lab to design experiments to validate the system.

It has since received grants from the National Science Foundation and the National Institutes of Health to develop this deep sleep-stimulating technology.

Here's how it works:

People came into the lab and we hooked them up to some devices. Two of them are here, but they're not fashion statements.

(Laughter) When it detected that people were going into deep sleep, it played a deep sleep stimulating sound that was indicated to encourage deep sleep.

I'm going to demo this sound now.

(repeats sound waves) Pretty weird, right?

(Laughter) So the sound is actually the same burst frequency as brain waves when the brain is in deep sleep.

That sound pattern actually evokes more brain delta waves to play.

When we asked the participants about the sound the next day, their brains responded with more delta waves, even though they were completely unaware that we were making the sound.

Here is an EEG image of a person from a study we conducted.

Can you see the panel below?

This indicates the sound being played at that burst frequency.

Next, look at the brain waves at the top of the graph.

From the graph we can see that the sound is actually producing more of these playback delta waves.

We've learned that it can accurately track sleep and help people sleep deeper without connecting them to electrodes.

We continue to develop appropriate sound and sleep environments to improve people's sleep health.

Our sleep isn't all that regenerative, but perhaps soon we'll be able to wear little devices to make better use of it.

thank you.

(applause)

Most people think that new or advanced technology will never start in Africa.

Instead, they believe that the best way to help the continent develop is to provide aid and services that the continent itself cannot provide.

So while developed countries are witnessing rapid growth in advanced technologies such as robotics and artificial intelligence, those same people worry that technologically backward Africa is falling behind.

That attitude couldn't be more wrong.

I am a robotics entrepreneur and have spent a lot of time here in Africa.

And in 2014, we founded Zipline, a company that uses electric autonomous aircraft to deliver medicines to hospitals and health centers on demand.

Last year, we launched the world's first automated delivery system operating on a national scale.

And what do you think?

I didn't do it in America, Japan, or Europe.

In fact, it was President Paul Kagame and the Ministry of Health of Rwanda who made a big bet on the potential of this technology and struck a commercial deal to supply the bulk of the country's blood on demand.

(Applause) Yes, they deserve applause.

So why is blood so important?

Between 60,000 and 80,000 units of blood are drawn annually in Rwanda.

In short, this is a product you really need, when you need it.

However, blood also presents challenges as it has a very short shelf life, different storage requirements and it is very difficult to predict the demand for all these different blood types before a patient actually needs something.

But the good news is that Rwanda is using this technology to centralize more blood and deliver it to hospitals and health centers when patients need it in an average of just 20-30 minutes.

Want to see how it works?

(audience) Yes.

This is our distribution center located about 20 kilometers from Kigali.

In fact, until nine months ago, this was a corn field, but in cooperation with the Rwandan government, we cleared the land and built this center in a few weeks.

So if a patient has an emergency, the hospital's doctors and nurses can send them a WhatsApp and tell them what they need.

And our team will start to act immediately.

We draw blood from stocks delivered by the National Transfusion Center. We scan the blood and put it into our system so that the Ministry of Health knows where it goes. Then basically zip it up. This is what we call a small autonomous aircraft that runs on batteries.

And when Zip is ready, it accelerates from 0 to 100 kilometers per hour in about half a second.

(Audience) Oh!

And from the moment it leaves the end of the launcher, it becomes completely autonomous.

(Video: Air Traffic Controller Directs Traffic) This is an air traffic controller arriving at Kigali International Airport.

When Zip arrives at the hospital, he descends to an altitude of about 30 feet and drops his cargo.

We use very simple paper parachutes, and simple is best. This ensures that your load gently and reliably hits the ground in the same spot every time.

So it's like ride sharing. A minute before we arrived, the doctor texted us to go out and have the birth.

(Laughter) And then -- (applause) And doctors have what they need to save their patients' lives.

This is actually monitoring deliveries from the fulfillment center. This vehicle is about 50 kilometers away.

You can monitor in real time how the vehicle gives birth in the hospital.

You may have noticed that there is a ping originating from that vehicle on your screen.

These pings are actually data packets that we are getting over the cellular network.

So these planes have SIM cards, just like cell phones, and they communicate over cellular networks to keep us informed of where they are and how they are doing.

Believe it or not, we actually purchased a family plan for this fleet (laughs). Because that's how you get the best price.

(Laughter) Actually, I'm not kidding.

(Laughter) So, today we are delivering about 20 percent of Rwanda's national blood supply out of Kigali.

We serve about a dozen hospitals and are adding hospitals to our network at an accelerating rate.

All of these hospitals only receive blood this way, and most of them actually place multiple orders each day.

The reason is that in all medical logistics there is always a trade-off between waste and access.

So if you want to solve waste, you have to centralize everything.

As a result, when a patient has an emergency, the medical products they need may not be available.

If you want to solve the access problem, stockpile large quantities of medicines in the last mile of hospitals and health centers so that patients can get the medicines they need.

However, you end up throwing away a lot of medicine, which is very expensive.

The amazing thing is that the Rwandan government was able to break this cycle for good.

Doctors have immediate access to what they need, so hospitals actually store less blood.

So while there has been a significant increase in the use of blood products in all the hospitals we serve, in the past 9 months there have been zero units of expired blood in any of these hospitals.

(Applause.) Great results.

In fact, this has not been achieved in any other medical system on the planet, but here it has happened.

But when we're talking about immediate delivery of medical products, it's clear that the most important thing is the patient.

Let's take an example.

A few months ago, a 24-year-old mother came into one of the hospitals we serve and gave birth by caesarean section.

But it caused complications and she started bleeding.

Luckily, the doctors had blood on hand that matched her blood type, delivered by regular zipline, so they transfused her with a few units.

However, she bled from those units in about 10 minutes.

In this case, in any hospital in the world, the mother's life is in grave danger.

Luckily, her doctors immediately called our distribution center, placed an emergency order, and our team actually performed emergency birth after emergency birth.

Finally sent 7 units of red blood cells, 4 units of plasma and 2 units of platelets.

That's more than there is blood in the whole body.

All of which were transfused to her and doctors were able to stabilize her condition and she is now healthy.

(Applause.) We've made about 400 such emergency deliveries since our inception, and there's such a story behind most of those emergencies.

Here are just a few of the mothers who have received blood transfusions this way in the past few months.

We are always reminded that when a doctor can help save a mother's life, it is not just her life that is being saved.

It is also a baby boy or girl who has a mother in the process of growing up.

(Applause.) But let me be clear: postpartum bleeding – this is not a Rwandan problem, or a developing country problem – is a global problem.

Maternal health is a challenge everywhere.

The main difference is that Rwanda is the first country to use radical technology to do something about this issue.

And that is why this attitude that Africa is destroyed, that advanced technology is not working here, that we need help is completely wrong.

Africa could become a destroyer.

These small, agile developing nations can innovate faster than the larger, richer economies.

And you can completely skip the absence of legacy infrastructure and move directly to newer and better systems.

In the year 2000, people would say you're crazy if you told them that a high-quality cellular network was about to roll out across Africa.

But no one expected how quickly these networks would connect and empower people.

Currently, 44% of Kenya's GDP goes through mobile payment platform M-Pesa.

Not only that, but our autonomous vehicles rely on that cellular network.

Over the next few years, it will also use its mobile payment platform to collect delivery charges as it begins to serve private healthcare facilities.

So innovation leads to more innovation, which leads to more innovation.

On the other hand, most people in developed countries believe that drone deliveries are technically impossible in East Africa, much less in East Africa on a national scale.

I'm talking about East Africa, not just Rwanda.

Just a few days ago on Thursday, the Tanzanian Ministry of Health announced that it will use this same technology to deliver immediate delivery of a wide range of medical products to the country's 10 million most hard-to-reach people.

(Applause.) It will actually be the largest autonomous system in the world.

To give you an idea of ​​what this looks like, this is one of the first fulfillment centers.

You can see that the service radius is 75 kilometers around the fulfillment center. That single distribution center can now serve hundreds of medical facilities and hospitals, all in rural areas.

However, serving more than 20% of Tanzania's population would require multiple distribution centers.

You'll actually need four.

Hundreds of life-saving deliveries are expected to be delivered daily from these distribution centers, and the system will eventually serve more than 1,000 medical facilities and hospitals across the country.

Yes, East Africa is progressing really fast.

I think one of the things that people tend to overlook is that this kind of leap creates compound profits.

For example, Rwanda's investment in healthcare infrastructure has given it an air logistics network that can be used to facilitate other parts of the economy, such as agriculture and e-commerce.

More importantly, 100% of the teams we employ in these distribution centers are local staff.

Here is our Rwanda team. This is an extraordinary group of engineers and operators.

They operate the world's only automated delivery system that operates nationwide.

They have learned something that the world's largest tech companies have yet to understand.

So they are complete heroes.

(Applause.) They are real heroes.

Our team's mission is to provide all 7 billion people on the planet with basic access to medicines, no matter how difficult it may be.

We often talk to people about our mission, and they say, 'So generous, so charitable.'

no!

Charity has nothing to do with it.

We have commercial contracts with the Ministry of Health, so these networks are 100% sustainable and scalable.

And the reason we want to correct that misconception is that entrepreneurship is the only force in human history that has lifted millions out of poverty.

(Applause.) No amount of foreign aid can sustainably employ 250 million African youth.

And the jobs these kids might have had ten years ago are largely automated or being dramatically changed by technology.

As such, they are looking for new skill sets, new competitive advantages.

They are looking for startup companies.

So why aren't more startups tackling these global problems facing billions of people in developing countries?

The reason is that investors and entrepreneurs are completely unaware of the opportunities.

We believe these issues are the domain of NGOs or governments, not private companies.

That's what we have to change.

You may have noticed something I forgot to mention in the video I showed you.

I didn't explain how the plane would land when it returned to the fulfillment center.

Therefore, as it may be obvious to you, our planes do not have landing gear.

We don't even have a runway where we operate.

So you should be able to slow the plane down from about 100 kilometers per hour to zero in half a second.

The method is to actually use wires to track planes as they arrive with centimeter-level accuracy.

We catch the plane from the sky and gently put it on an actively inflated cushion.

This is basically an aircraft carrier combined with a bouncy castle.

(Laughter) So let me show you.

(Laughter) (Applause) And it may be clear why I wanted to end with this video.

I wanted to show the kids and teens that line the fence every day.

They cheer at every launch and landing.

(Laughter) (Applause) Jet lag can actually get me to the fulfillment center early.

Arrive 1 hour before the start of surgery.

And there will be kids with good seats on the fence.

(Laughter) And you go up and ask them, 'What do you think about planes?

And they'll say, "Oh, it's an empty ambulance."

So they get it.

I mean, they understand it better than most adults.

So I asked earlier, who will create the disruptive tech companies in Africa in the next decade?

Ultimately it's up to the kids.

They are engineers from Rwanda and Africa.

They are the engineers responsible for our common future.

But the only way they can build that future is if we understand that world-changing companies can scale in Africa, and that disruptive technologies can start here.

thank you.

(applause)

Charles Van Doren, who later became senior editor at Britannica, said the ideal encyclopedia should be radical and stop being safe.

But if you know anything about the history of Britannica since 1962, it was never radical and was still a very perfectly safe, rigid type of encyclopedia.

Wikipedia, on the other hand, starts with a very radical idea for all of us to imagine a world in which every person on the planet has free access to the collective body of human knowledge.

That's what we do.

So Wikipedia, as I just saw a little demonstration of, is a free-licensed encyclopedia.

This book has been written in so many languages ​​by thousands of volunteers around the world.

It's written using wiki software (the kind of software he just demonstrated), so anyone can edit it quickly, save it, and publish it on the Internet in no time.

And everything on Wikipedia is managed by a staff of virtually all volunteers.

So when Yochai talks about new ways of organizing, he's really talking about Wikipedia.

What I'm going to do today is go into a little more detail on how it actually works under the hood.

Wikipedia is owned by the Wikimedia Foundation, a non-profit organization I founded.

And our goal, the central purpose of the Wikimedia Foundation, is to provide a free encyclopedia for everyone on the planet.

When you think about what that means, it means more than just building a cool website.

We care deeply about everything from the digital divide around the world, to poverty, to ensuring people everywhere have the information they need to make good decisions.

So we will have to do a lot more than just the internet.

That's a big part of why we chose the free license model. Because it empowers local entrepreneurs and those who want it. They can take our content and do whatever they want with it, they can copy it, they can redistribute it, and they can do it commercially or non-commercially.

Therefore, there will be many opportunities around Wikipedia around the world.

We are funded by public donations, but one of the more interesting things is how little money it actually costs to run Wikipedia.

So Yochai showed a graph of the cost of the printing press.

And I'll explain the pricing on Wikipedia.

So there are over 600,000 articles in English.

There are a total of 2 million articles across various languages.

The largest languages ​​are German, Japanese and French. Western European languages ​​are all very large.

However, of all the traffic to the web cluster, only about a third of it goes to the English Wikipedia, which surprises many.

A lot of people on the internet have a very English-centric mindset, but for us it's truly global.

We use so many languages.

Our popularity is among the top 50 websites and more popular than the New York Times.

Here is Yochai's argument.

This shows the growth of Wikipedia -- we're the blue line there -- and this is the New York Times over there.

And what's interesting about this is that the New York Times website is such a huge corporate operation that it has no idea how many hundreds of employees it has.

We have only one employee and that employee is our lead software developer.

And he's only been with us since January 2005, and all other growth prior to that...

As such, the server is maintained by a ragtag group of volunteers.

All editing is done by volunteers.

And our organizational form is unlike any traditional organization you might imagine.

People always ask, "So who's in charge of this?"

or "Who does that?"

It is a very unusual and chaotic event.

We currently have over 90 servers in 3 locations.

These are maintained by online volunteer system administrators.

Whenever I go online at any time of the day or night, I see 8-10 people waiting for me with server questions and such.

The company cannot afford to do that.

We can't afford 24/7 staff to do what we do on Wikipedia.

We get about 1.4 billion pageviews every month, so this is a really big deal.

And all are run by volunteers.

The total monthly cost for bandwidth is approximately $5,000.

And that's essentially our main cost.

You can actually get by without employees.

We hired Brian because he worked part-time and full-time at Wikipedia for two years, so we really hired him so he could make a living and go to the movies every once in a while.

The big question when you have such a truly chaotic organization is why isn't everything garbage?

Well, pretty good.

It's not perfect, but it's much better than expected given the completely chaotic model.

So when you see him silly editing a page about me, you think, "Oh, this is clearly going to be garbage."

But when we look at quality testing, and that testing is still not good enough, which really encourages people to test more by comparing Wikipedia to its traditional counterparts, we are steadfastly winning.

So a German magazine compared Wikipedia in German, which is much smaller than English, to Microsoft Encarta and Brockhaus Multimedia, and we won outright.

They hired an expert to look at the articles and compare the quality. And we were very happy with the results.

So many of you have probably heard of the Wikipedia Bush and Kelley controversy.

The media covered this to some extent.

It started with a Red Herring article.

Reporters called me. I mean, they got my name spelled right, but what they really meant was that the Bush-Kelly election was highly controversial and tearing the Wikipedia community apart.

So they quoted me and said, "They are the most controversial figures in Wikipedia's history."

What I actually said is that they have no objections at all.

So it's a bit of a misquote.

And it's true that I had to lock the article several times.

Time magazine recently reported that "Wales locked entries on Kerry and Bush for most of 2004, even though they sometimes have to go to extremes."

This happened after I told a reporter that sometimes I had to lock a little bit here and there.

So the general truth is that the kind of disputes you probably think of within the Wikipedia community aren't really disputes at all.

Articles on controversial topics are edited frequently, but do not cause much controversy within the community.

The reason is that most people understand the need for neutrality.

The real struggle is not between the Right and the Left, as most people think it is, but between the Thinking Party and the Foolish Party.

And neither side of the political spectrum can have a monopoly on either of these qualities.

The actual truth about the specific Bush v. Kelley case is that less than 1% of Bush v. Kelley articles were locked in 2004, and not because of the controversy. It was just because there was vandalism on a daily basis – it happens sometimes on stage too...

(Laughter) Sometimes even reporters have reported to me that they destroyed Wikipedia and I'm surprised it was fixed so quickly.

And I said - you know, I always say, please don't do that.

So how do we do this?

How should quality control be managed?

How does it work?

There are several elements, mainly social policy and some elements of software.

So the biggest and most important thing is the neutral point of view policy.

This has been the core principle of my community since the beginning and is completely undisputed.

Since this is a social concept of cooperation, there is not much to say about truth or objectivity.

The reason is that if I tell you to write only the "truth" about a topic, it doesn't help you think about what to write. Because I can't agree with you on what the truth is.

But we have a jargon of neutrality, which has its own long history within the community, and basically says that whenever there is a controversial issue, Wikipedia itself should not take a stand on it.

We just have to report what the reputable party said about it.

So this neutrality policy is very important to us because it allows our very diverse community to come together and really get the job done.

Therefore, we have a very diverse contributor in terms of political, religious and cultural backgrounds.

Adopting this solid policy of neutrality, non-negotiable from the start, will get people to work together and ensure that Entry isn't just a war waged between the Left and the Right.

If you engage in such behavior, you will be asked to leave the community.

In other words, real-time peer review.

All changes on the site go to the "Recent changes" page.

So as soon as I made a change, I went to the "recent changes" page.

This recently modified page was also fed into an IRC channel, an Internet chat channel that people monitor with various software tools.

And people can subscribe to RSS feeds and receive email notifications about changes.

And users can set up their own personal watchlists.

My page gets destroyed from time to time, so I'm on a watch list of quite a few volunteers.

So it happens that someone immediately notices the change and simply reverts it.

For example, there is a "new page feed" so you can go to a particular page on Wikipedia and see all the new pages that have been created.

This is very important. Because many of the new pages are just garbage that should be deleted, like "ASDFASDF".

But that's part of the most interesting and fun thing, and part of the new article.

People will start writing articles about some interesting topic, and others will find it interesting and will join in and help make the article even better.

Therefore, edits by anonymous users exist. This is one of the most controversial and interesting things about Wikipedia.

So Chris was able to make changes without having to login or anything. He just went to the website and made the changes.

However, it turned out that only about 18% of all edits to the website were made by anonymous users.

And this is a very important thing to understand. Most of the edits made on the website come from a very close-knit community of perhaps 600-1,000 people in constant communication.

And we have over 40 IRC channels and 40 mailing lists.

All these people know each other.

They're the people who do most of the site, and in a way they're semi-professional in what they do.

Our own standards meet or exceed professional quality standards.

We don't always meet these standards, but that's what we aim for.

And what really cherishes this site is the close-knit community, they're some of the smartest people I've ever met.

It's my job to say so, but it really is.

The types of people who are attracted to writing encyclopedias as a hobby are often pretty smart people.

Tools and Software: There are many tools that allow us, the community, to self-monitor and monitor all our work.

Here is an example of the page history for "Flat Earth" and you can see that some changes have been made.

The good thing about this page is that when you look at it, you immediately say "I got it".

If someone goes and looks, they see that someone with an anonymous IP number edited my page.

I doubt that. Who is this person?

When someone looks at it, they immediately see all the changes that have happened highlighted in red. I see, this word has changed, you can see something like this.

So, this is one of the tools you can use to monitor your page history very quickly.

Another thing we do within the community is to keep everything very open-ended.

Most social rules and ways of working are left completely free within the software.

All that stuff is just on the wiki page.

So nothing in the software enforces the rules.

The example we've covered here is the "Vote for Removal" page.

So, as I said before, people type "ASDFASDF", which should be removed.

In such cases, an administrator simply removes them.

There's no reason to have a big argument about it.

But I can imagine there are many other areas where the question is being asked: Is this worthy of attention enough to be included in an encyclopedia?

Is the information verifiable? Is it a hoax? really? what is that?

So we needed a social way to find answers to this.

So the method that was born organically within the community is the "vote deletion" page.

And in our particular example here, it's the movie "Twisted Issues" and the first person says "This is probably a movie. It fails the Google test miserably."

The Google test checks Google to see if it exists. Because what doesn't even exist on Google probably doesn't exist at all.

It's not a perfect rule, but it's a good starting point for a quick investigation.

So someone says, "Please delete it. Please delete it. It's not noticeable."

And someone says, "Wait, I found it. I found it in the book Movie Threat Video Guide: 20 Underground Movies You Must See."

Someone says, "I found it on IMDB. Keep it, keep it."

And the interesting thing about this software is that these votes are just text typed into a page.

This isn't really a vote, it's a dialogue.

Sure, at the end of the day, an admin can go here, look at this, and say, "OK, 18 deleted, 2 kept. I'll delete it."

But in other cases, this could be 18 deletes and 2 saves, and we'll keep it. Because if those last two things say "Wait a minute. No one else has seen this, but I found it in a book. And I found a link to a page that talks about it. I'll clean it up tomorrow, so don't delete it."

It also matters who votes.

Like I said, it's a tight-knit community.

At the bottom here, 'Keep, the real movie', RickK.

RickK is a very well-known Wikipedian who has done a huge amount of work on vandalism, hoaxes, votes to remove, etc.

His voice is very important within the community because he knows what he is doing.

So how is all this managed?

People really want to know about admins and such.

In short, Wikipedia's governance model, or community governance, is a highly elusive yet workable set of consensus. In other words, I try not to vote on the content of articles because the majority opinion is not necessarily neutral. There is some degree of democracy, all admins have the power to delete pages.

That doesn't mean you have the right to remove the page.

They still have to follow all the rules, but they are elected by the community.

Occasionally, random trolls on the Internet want to accuse me of picking administrators to bias the encyclopedia's content.

I always laugh at this because I have no idea how they get elected.

There is a certain amount of aristocracy.

You got a hint of it when I said that RickK's voice carries a lot more weight than someone we don't know.

I sometimes tell this story with Angela, who has just been re-elected to the Foundation Board from the community with more than twice as many votes as those who lost.

And I always embarrass her. "Well, for example, Angela can do whatever she wants on Wikipedia because she's so well respected and so powerful."

But the irony is that Angela can do this because she's the only person you know will never break Wikipedia's rules.

And I'd like to say that she's the only one who actually knows all the Wikipedia rules...

And then there's the monarchy, and that's my role in the community...

(Laughter.) I used to explain this in Berlin, and the next day the headline in the newspaper said, "I am the Queen of England."

(Laughter) It's not quite what I said, but -- (Laughter) it's my role in the community that matters -- in the free software world, there's a long tradition of the "benevolent dictator" model.

So if you look at most major free software projects, you'll find one person in charge, whom everyone agrees on, is a benevolent dictator.

Well, I don't like the term "Benevolent Dictator" and I don't see it as my job or role in the world of thought to be the future dictator of all the world's amassed human knowledge.

it is not appropriate.

But there is still some degree of monarchy, some degree of necessity. Sometimes we have to make decisions, but we don't want to get too bogged down in formal decision-making processes.

An example of how important this is was the recent discovery of Wikipedia by a neo-Nazi website. They said, "Oh, this is terrible, a Jewish conspiracy by the website, and certain articles that we don't like will be removed."

And then we found out they have a voting process, so we're going to send members in and they'll all vote to remove these pages. ”

We were able to gather 18 participants.

That's neo-Nazi math for you.

They always think they have 40,000 when they have 18 members.

But they managed to get 18 people to vote by doing the rather stupid thing of deleting a perfectly valid article.

Of course, the vote ended up being about 85 to 18, so there was no real danger to our democratic process.

On the other hand, people said, "But what are you going to do?

I mean, things like this can happen.

What if someone's group was seriously organized and wanted to vote? ”

Then I said, "Well, fuck, just change the rules."

That's my job in the community. Our openness and freedom will not allow us to compromise the quality of our content.

So as long as people trust my role, it's a valid place for me.

Of course, the license is free, so if I do a terrible job, the volunteers are happy to take it and leave. I can't tell anyone what to do.

A final point here is that to understand how Wikipedia works, it is important to understand that while the Wiki model is how we work, we are not fanatical web anarchists.

In fact, we are very flexible with our social methods. Because ultimately the community's passion is for the quality of their work, not necessarily for the process they use to generate it.

(Applause) Ben Saunders: Yes, hello Ben Saunders.

Jimmy, you said fairness is the key to Wikipedia's success.

It strikes me that many of the textbooks used to educate children are inherently biased.

Did you know that Wikipedia is used by teachers? How do you think Wikipedia will change education?

Jimmy Wales: Well, many teachers are starting to use Wikipedia.

There is a media article on Wikipedia which I believe is incorrect.

It's based on a blogger vs. newspaper story.

There is a funny story called Wikipedia, but scholars and teachers hate it.

Last time I received an email from a journalist asking, "Why do scholars hate Wikipedia?"

I was recently appointed a Fellow at Harvard University, so I sent it from my Harvard email address.

And I said, "Well, not everyone hates it."

(Laughs) But I think it will have a big impact.

And in fact, there is a project that I am personally very much looking forward to. It's a Wikibooks project. This is an effort to produce textbooks in all languages.

And it's a much larger project.

It will take about 20 years to realize.

But part of it is fulfilling our mission to provide an encyclopedia for everyone on the planet.

I don't mean to spam AOL-style CDs.

That means giving them tools they can use.

And for many people around the world, giving them a college-level encyclopedia is of no use without a ton of reading and writing materials to build it up to a working level.

The Wikibooks project is an effort to do just that.

And it may not come from us. All kinds of innovations are happening.

But the next most important thing in education is free and licensed textbooks.

little by little.

In fact, for the next 18 minutes, I'll do my best to explain the beauty of particle physics without equations.

It turns out there is a lot we can learn from corals.

Corals are very beautiful and rare animals.

Each coral head is made up of thousands of individual polyps.

These polyps continuously bud and branch into genetically identical adjacent polyps.

Imagining this to be a highly intelligent coral, you can single out an individual and ask him rational questions.

We can ask how he came to this particular place exactly in comparison with his neighbor. Is it just a coincidence, or fate, or what?

Well, after admonishing us for overheating the temperature, he said our question was totally stupid.

There's something mean about these corals, and I have the surf scars to prove it.

But this polyp continued, telling us that his neighbor was apparently an exact copy of him.

That he was in all other places as well, but experiencing them as separate individuals.

For corals, branching into different copies is the most natural thing in the world.

Unlike us, superintelligent corals will be uniquely prepared to understand quantum mechanics.

The mathematics of quantum mechanics explains with great precision how our universe works.

And it tells us that our reality continues to diverge into various possibilities like coral.

It's a strange thing for us humans to wrap our thoughts around. Because we can only experience one possibility at a time.

This quantum oddity was first explained by Erwin Schrödinger and his cat.

Cats like this version better.

(Laughter) In this setting, Schrödinger is in a box with a radioactive sample, but the laws of quantum mechanics bifurcate into an radiated state and a non-radiated state.

(Laughter) The branch from which the sample is emitted triggers the release of the poison and Schrödinger dies.

But in another realm of reality, he lives on.

These realities are experienced separately by each individual.

As far as either one knows, the other does not exist.

This seems strange to us. Because we only experience each individual existence and cannot see the other branches.

It's as if each one of us, like Schrödinger here, is like a coral branching into different possibilities.

The mathematics of quantum mechanics tells us that this is how the world works on a small scale.

It can be summed up in one word. "Anything that can happen will actually happen."

That's quantum mechanics.

But this does not mean that everything will happen.

The rest of physics is explaining what can and cannot happen.

Physics tells us that it all boils down to the interaction of geometry and elementary particles.

And things only happen when these interactions are perfectly balanced.

Now let's talk about how we know about these particles, what they are, and how this balance works.

In this machine, beams of protons and antiprotons are accelerated to near the speed of light and collide, producing a burst of pure energy.

This energy is quickly converted into a spray of subatomic particles, which are characterized using detectors and computers.

This gigantic machine, the Large Hadron Collider at CERN in Geneva, is 27 miles in circumference and consumes five times as much electricity as the city of Monterey when running.

It is not possible to predict exactly what particles will be produced by individual collisions.

Quantum mechanics tells us that all possibilities are possible.

But physics tells us what kind of particles are produced.

These particles must have as much mass and energy as are carried by protons and antiprotons.

Particles of mass above this energy limit are not produced and remain invisible to us.

This is why this new particle accelerator is so attractive.

This energy limit will be seven times higher than before, so new particles will appear soon.

But before we talk about what we see, let's describe the particles we already know.

There is a whole menagerie of subatomic particles.

Most of us are familiar with electrons.

Many people in this room make a good living by chasing themselves.

(Laughter) But electrons also have neutral partners called neutrinos, which have no charge and very little mass.

In contrast, up and down quarks have very large masses and combine into three to create protons and neutrons within atoms.

All of these matter particles have left-handed and right-handed varieties and have oppositely charged antiparticle partners.

These well-known particles also have lesser-known second and third generations, which carry the same charge as the first generation but much higher mass.

All of these matter particles interact with various force particles.

Electromagnetic forces interact with charged matter through particles called photons.

There are also very weak forces called "weak forces", which may seem unimaginable.

(Laughter) It only interacts with left-handed matter.

Strong forces act between quarks that carry three different kinds of charges: red, green, and blue, called color charges.

You can blame Murray Gell-Mann for these names, but it's his fault.

Finally, there is gravity, which interacts with matter through mass and spin.

The most important thing to understand here is that each of these forces has a different kind of charge associated with it.

These four different forces interact with matter according to the corresponding charge that each particle has.

The particle that has yet to be found, but is believed to exist, is the Higgs boson, which gives all other particles their mass.

The main purpose of the Large Hadron Collider is to observe this Higgs boson, and it is almost certain that it will be observed.

But the biggest mystery is what else we can see.

Towards the end of this talk, I want to show you one great possibility.

Now, if we count all these different particles with different spins and charges, we get 226.

There are many particles that must be tracked.

And it seems strange that there are so many elementary particles in nature.

But plotting them according to the charges reveals some beautiful patterns.

The most familiar electric charge is electric charge.

Electrons have a negative charge and quarks have one-third the charge.

So when two up quarks and one down quark combine to make a proton, the total charge is +1.

These particles also have antiparticles with opposite charges.

Now it turns out that the charge is actually a combination of two other charges, a super charge and a weak charge.

If we spread out the super and weak charges and plot the particle charge in this two-dimensional charge space, the charge is where the particle lies along the vertical direction.

Electromagnetic and weak forces interact with matter according to its super and weak charges to form this pattern.

This is called the unified electroweak model and was compiled in 1967.

The reason most of us are only familiar with electric charges and not both is because of the Higgs boson.

The Higgs here on the left has a large mass, breaking the symmetry of the electroweak pattern.

Giving the weak particles a large mass makes the weak forces very weak.

Since this massive Higgs lies along the horizontal direction of the diagram, electromagnetic photons remain massless and interact with charges along the vertical direction of this charge space.

Electromagnetic and weak forces are thus described by this pattern of particle charges in two-dimensional space.

To include the strong force, spread out its two charge directions and plot the charges of the force particles within the quarks along these directions.

The charges of all known particles are plotted in the 4-dimensional charge space and thus projected into 2 dimensions so that we can see them.

Whenever particles interact, nature keeps things in perfect balance along all four of these charge directions.

When a particle and an antiparticle collide, a burst of energy is released that brings the total charge to zero in all four charge directions.

At this point we can create anything with the same energy as long as the total charge remains zero.

For example, this weak force particle and its antiparticle can be produced by a collision.

In further interactions the charges must always be balanced.

One of the weaker particles can decay into an electron and an antineutrino, and even with those three added the total charge is zero.

Nature is always in perfect balance.

So these billing patterns aren't just beautiful.

They tell us what interactions are allowed to occur.

And we can rotate this charge space in four dimensions to better observe the strong interactions with this wonderful hexagonal symmetry.

In a strong interaction, such a strong force particle interacts with this green-like colored quark to give a quark with a different color charge (this red quark).

And every atom in our body undergoes millions of powerful interactions every second that hold the nuclei together.

But these four sins corresponding to the three powers do not end there.

You can also include two more charges corresponding to gravity.

Including these, each particle of matter has two different spin charges (spin up and spin down).

So they are all split giving a nice pattern to the 6-dimensional charge space.

If we rotate this pattern in 6 dimensions, we can see that it is very clean.

At the moment, this pattern is consistent with our best current knowledge of how nature is organized at these subatomic small scales.

This is what we know for sure.

Some of these particles are at the limits of what we can experimentally reach.

From this pattern we already know the particle physics at these small scales. How the universe works on these tiny scales is quite beautiful.

But from now on, we'll be discussing new and old ideas about things we don't yet know.

We want to extend this pattern using only math and see if we can get our hands on the whole enchilada.

We want to find all the particles and forces that make up the universe as a whole.

And we want to use this image to predict new particles that will appear when the experiment reaches higher energies.

Thus, there is an old idea in particle physics that this known charge pattern, which is not very symmetrical, could emerge from a more perfect pattern that breaks, much like the Higgs boson breaks the electroweak pattern and gives it an electromagnetism.

To do this, we need to introduce a new force with a new charge direction.

Introducing a new direction allows us to infer what kind of charge a particle has along this direction, allowing us to rotate it along other directions.

If we guess wisely, we can construct a standard charge in six charge dimensions as a broken symmetry of this more perfect pattern in seven charge dimensions.

This particular choice corresponds to the Grand Unified Theory introduced by Patti and Salam in 1973.

Looking at this new unified pattern, we can see some gaps where particles seem to be missing.

This is how a unified theory works.

Physicists look for larger, more symmetrical patterns that contain established patterns as subsets.

Larger patterns can predict the presence of never-before-seen particles.

This integrated model predicts the existence of these two new force particles. These particles are much like weak forces, only weaker.

Now let's rotate this set of charges in 7 dimensions and consider some strange facts about matter particles. The second and third generations of matter have exactly the same charge as the first generation in the 6-dimensional charge space.

These particles are not uniquely identified by their six charges.

In standard charging spaces they are placed on top of each other.

But if we work in an eight-dimensional charge space, we can assign each particle a unique new charge.

Then rotate these in 8 dimensions to see what the whole pattern looks like.

Here we now see the second and third generations of matter, related to the first generation by a symmetry called "tripleness".

This particular charge pattern in eight dimensions is actually some of the most beautiful geometric constructions in mathematics.

It is the pattern of the largest exceptional Lie group E8.

This Lie group is a 248-dimensional smooth curve shape.

Each dot in this pattern corresponds to the symmetry of this very complex and beautiful shape.

One small part of this E8 geometry describes the curved spacetime of Einstein's general theory of relativity and can be used to explain gravity.

Combined with quantum mechanics, this shape geometry could potentially explain all about how the universe works at the tiniest scales.

This pattern of shapes in an eight-dimensional charge space is so beautiful that it encapsulates the thousands of possible interactions between these particles, each one just one facet of this complex shape.

Rotate to see many other intricate patterns included in this pattern.

And with a certain rotation, we can look down on this pattern in 8 dimensions along the axis of symmetry and see all the particles at once.

It's a very beautiful object, and like any other integration, you can see some holes in this pattern that require new particles.

There are 20 gaps where new particles should be, two of which are filled by Patti-Salam particles.

From their position in this pattern, we see that these new particles should be scalar fields like the Higgs, but have color charges and interact with strong forces.

Filling in these new grains completes this pattern and gives us the perfect E8.

This E8 pattern has very deep mathematical roots.

Many consider this to be the most beautiful structure in mathematics.

It is a fantastic prospect that objects of this great mathematical beauty can describe the truth of particle interactions at the smallest imaginable scale.

And this idea that nature is described by mathematics is nothing new.

In 1623 Galileo wrote: "The magnificent book of nature, always open to our gaze, is written in the language of mathematics.

The letters are triangles, circles, and other geometric figures, without which it would be impossible for a human being to understand a single word. Without these, one would be wandering in a dark labyrinth. ”

I believe this to be true, and have tried to explain the mathematics of particle physics using only triangles, circles, and other geometric figures, following Galileo's guidance.

Of course, when other physicists and I actually tackle this problem, the math can resemble a dark maze.

But you can rest assured that at the heart of this mathematics is pure, beautiful geometry.

This mathematics, coupled with quantum mechanics, describes our universe as a growing E8 coral, with particles everywhere and interacting in all manner of beautiful patterns.

And as more of the pattern is revealed using new machines like the Large Hadron Collider, we may be able to tell if nature uses this E8 pattern or something else.

This process of discovery is a wonderful adventure to take part in.

If the LHC finds a particle that fits this E8 pattern, that would be pretty cool.

If the LHC discovers new particles that don't fit this pattern, that would be very interesting, but bad for this E8 theory.

And of course it's bad for me personally.

(Laughter) Now, how bad could that be?

Well, pretty bad.

(Laughter) But predicting how nature works is a very dangerous game.

This and similar theories have a high probability of being unrealizable.

One puts a lot of effort into knowing that most of these ideas are probably not true about nature.

That's what I do in theoretical physics. Lots of wipeouts.

In this respect, the new physics theory is much like a start-up.

As with any large investment, it can be emotionally difficult to abandon a line of research if it doesn't pay off.

But in science, if something doesn't work, you have to throw it away and try something else.

Now, the only way to maintain sanity and achieve happiness in the midst of this uncertainty is to maintain balance and perspective in life.

I have tried my best to live a balanced life.

(Laughs) I try to balance my life evenly between my three directions: physics, love, and surfing.

(Laughter) That way, even if the physics I'm working on sucks, I'm sure I've lived a good life.

And I try to live in beautiful places.

For most of the last 10 years, I have lived on Maui, a very beautiful place.

Now, to my parents, one of the universe's greatest mysteries is how I managed to survive so long without engaging in anything resembling full-time employment.

(Laughter) Let me tell you the secret.

This is the view from my home office on Maui.

And this is another and another.

And you may have noticed that while these beautiful views are similar, they are in slightly different locations.

Because this was my home and office on Maui.

(Laughter) I chose a very unusual life.

But now that I no longer have to worry about rent, I can spend my time doing what I love.

The nomadic life was tough at times, but it allowed me to live in a beautiful place and keep my life in balance, which makes me happy.

It allows me to spend more time with highly intelligent corals.

But I also really enjoy hanging out with highly intelligent people.

So I am very happy that you invited me to TED.

thank you very much.

(Applause.) I probably only understood two percent, but I still really loved it.

All Your Theories -- Garrett Lisi: I'm used to corals.

CA: That's right.

At least some people are excited about this story because, if you're right, it ties gravity and quantum theory together.

So are we saying that we should think about the center of the universe, that the smallest thing that exists is somehow the subject of E8's possibilities?

I mean, is there a scale at the smallest scale, or...?

GL: Well, the pattern I just showed corresponds to what we know about particle physics. It already corresponds to a very beautiful shape.

And that's what I said we know for sure.

And there are striking similarities in their shapes, and how they fit into this E8 pattern could also be the rest of the picture.

And the patterns of these dots that I have shown you actually represent the symmetry of this higher dimensional object that distorts, moves and dances in space-time as we experience it.

And that would explain all these subatomic particles that we see.

CA: But string theorists, from what I understand, describe the electron in terms of a much smaller string that vibrates -- I know you don't like string theory -- that vibrates within it.

How should we think of electrons in relation to E8?

GL: Well, it would be one of the symmetries in the shape of this E8.

So what's happening is that the shape is twisting as it moves through space-time.

And the direction it twists as it moves is the particle we see.

So it's -- CA: E8 shape size, but what does that have to do with electrons?

I feel like my photos need it. is it bigger? small?

GL: As far as we know, electrons are point particles, so this extends to the smallest possible scale.

So the way quantum field theory explains these things is that all possibilities are expanding and developing at the same time.

This is why I use the coral analogy.

And -- in this way, E8 appears as a shape attached to each point in spacetime.

And, as I said earlier, the way the shape twists, that is, the direction in which the shape twists as it moves on this curved surface, is the elementary particle itself.

Therefore, through quantum field theory, they appear as points and interact as such.

I'm not sure if I can be more clear.

(laughs) CA: It doesn't really matter.

It evokes a certain sense of wonder, and I certainly want to understand this more.

But thank you so much for coming. It was really charming.

(applause)

Since their emergence over 200,000 years ago, modern humans have established homes and communities on Earth.

But they didn't do it alone.

Wherever Homo sapiens are today on Earth, you will likely find another species nearby, Canis lupus famialiis.

Herding, hunting, sledding and slouching, the variety of domestic dogs is astounding.

But what makes mankind's best friend stories amazing is that they all evolved from a creature seen as one of the oldest rivals: the gray wolf.

When our Paleolithic ancestors first settled in Eurasia about 100,000 years ago, wolves were one of the main rivals to the top of the food chain.

It can exert over 300 lbs of force. Withstanding bone-crushing pressure and sniffing out prey more than a mile away, these formidable predators had little competition.

Much like human hunter-gatherers, they lived and hunted in complex social groups of small nuclear families, using their social skills to cooperate and take down larger creatures.

Using these collective tactics, they acted as effective tenacious hunters, not relying on overtaking their prey, but chasing it to exhaustion.

But when faced with the similar strength of an invasive new neighbor, the wolves found themselves at a crossroads.

For most herds, these fast-growing bipeds were a serious threat to their territories.

But for some wolves, especially those without packs, human camps have presented new opportunities.

Wolves that have shown less aggression towards humans may eat leftovers and approach camps.

And as these more docile scavengers outlived their aggressive kin, their genetic traits were passed on, gradually breeding domesticated wolves in areas closer to human habitat.

Over time, humans discovered many uses for this docile wolf.

They were useful in tracking and hunting prey, and may have served as sentinels to protect camps and warn of approaching enemies.

Their similar social structure made it easier for them to integrate into their human families and learn to understand their commands.

Eventually, they migrated from the fringes of our community into our homes, becoming the first domesticated humans.

The earliest of these proto-dogs, or wolf-dogs, appear to have emerged about 33,000 years ago and looked not too different from their wild cousins.

They were distinguished mainly by their small size and a short snout filled with relatively small teeth.

But as human cultures and occupations have become more diverse and specialized, so have our friends.

A short stocky dog ​​that gathers livestock by pinching its heels. Elongated dogs for driving badgers and foxes out of their burrows. A slender, smooth racing dog. And a muscular large dog as a guard.

With the advent of the Kennel Club and dog shows in Victorian England, these breeds were standardized as breeds and many new breeds were bred purely for the sake of appearance.

Sadly, all dog breeds are products of human selection, but some breeds are healthier than others.

Many of these aesthetic features come with congenital health problems such as difficulty breathing and susceptibility to spinal cord injuries.

The longest experiment on controlled human evolution had other side effects as well.

For generations, the selection for tameness has favored the younger, more docile traits that humans prefer.

This phenomenon of selecting for traits associated with youth is known as neoteny and is found in many livestock.

Thousands of years of co-evolution may have connected us chemically.

Not only can dogs understand human emotions and body language, but when dogs and humans interact, both bodies release oxytocin. A hormone generally associated with feelings of affection and protection.

It can be difficult to understand how Pomeranians, Chihuahuas and Poodles are descended from ferocious wolves.

But today's breed diversity is the result of previous relationships with cities, agriculture, and even the disappearance of our Neanderthal cousins.

And it's comforting to know that given enough time, even the most dangerous of rivals can become the most powerful of friends.

In 132 AD, Chinese polymath Zhang Heng presented his latest invention to the Han court.

This large vase, he claimed, would inform the kingdom whenever there was an earthquake, including the direction to send aid.

The court was somewhat skeptical, especially when the device kicked in on a seemingly quiet afternoon.

But a few days later, their suspicions turned to gratitude when a messenger came asking for help.

Today, we no longer rely on pots to identify seismic phenomena, but earthquakes still present a unique challenge for those trying to track them.

So why are earthquakes so difficult to predict? How can we predict earthquakes more accurately?

To answer that, we need to understand some theories behind how earthquakes occur.

The Earth's crust is made up of several huge, jagged slabs of rock called tectonic plates, each of which rests on hot, partially molten layers of the Earth's mantle.

Because of this, the plate spreads out very slowly by 1-20 centimeters per year.

But these small movements are powerful enough to cause deep cracks in the interacting plates.

And in unstable areas, increased pressure can eventually trigger earthquakes.

Monitoring such subtle movements is difficult enough, but the factors that turn changes into seismic phenomena are much more diverse.

Different fault lines juxtapose different rocks, some of which are stronger and some weaker under pressure.

Different rocks also react differently to friction and high temperatures.

Some may partially melt, releasing a lubricating fluid made up of superheated minerals that reduces fault friction.

But some are left to dry and tend to build dangerous pressures.

And all these faults are subject to different gravitational forces and hot rock flows that move throughout the Earth's mantle.

So which of these hidden variables should we analyze, and how do they fit into our growing forecasting toolkit?

Some of these forces occur at nearly constant velocity, making the plate motion somewhat periodic.

Many of the most reliable clues now come from long-term forecasts related to when and where previous earthquakes occurred.

This will allow us to predict when active faults like San Andreas will cause major earthquakes over millennia.

However, due to the many variables involved, this method can only predict very broad timeframes.

To predict more imminent events, researchers studied the vibrations the Earth causes before earthquakes.

Geologists have long used seismometers to track and map these small changes in the Earth's crust.

And now most smartphones can also record primary seismic waves.

With a worldwide telephone network, scientists could crowdsource a rich and detailed warning system to warn people of upcoming earthquakes.

Unfortunately, the phone may not provide the advance notice required to enact safety protocols.

But such detailed measurements are still useful for predictive tools like NASA's Quakesim software, which can use a precise mix of geological data to identify areas at risk.

But recent research has shown that the most obvious signs of earthquakes may not be visible to all these sensors.

In 2011, just before an earthquake hit Japan's east coast, nearby researchers recorded surprisingly high concentrations of the radioactive isotope pair radon and thoron.

When stress builds up in the crust just prior to an earthquake, microcracks allow these gases to escape to the surface.

These scientists believe that building a large network of radontron detectors in earthquake-prone areas could be a promising warning system, predicting earthquakes a week in advance.

Of course, none of these technologies are as useful as simply looking deep inside the Earth itself.

With a deeper view, we may be able to track and predict large-scale geological changes in real time, potentially saving tens of thousands of lives each year.

But for now, these technologies will help us quickly prepare and respond to areas of need without waiting for instructions from the vase.

dabble in design. I am an architecture and design curator. I happen to be at the Museum of Modern Art in New York.

But what we are going to talk about today is really about design. A really good designer is like a sponge. They are really curious, absorbing all kinds of information that comes in and transforming it for people like us to use.

Every design show I curate looks into another world in a way, and that gives me a chance. And it feels great every time I change jobs, so that's great.

And what I'm going to do today is give a preview of the next exhibition I'm working on. It's called "Design and a Resilient Mind".

The worlds that I have decided to focus on this time are the world of science and the world of technology.

Whenever design is involved, technology is involved, but science plays a lesser role.

But designers are great at taking big revolutions that happen and turning them into something we can use.

And this is the highlight of this exhibition.

If you think about your life today, you are going through different scales, different rhythms and pace changes every day.

Work in different time zones, talk to completely different people, and multitask. We all know it, and in some ways we do it automatically.

Some in this audience are very flexible, some are a little slow, some have stretch marks, but still, from this perspective, this is a very exceptional audience.

Others are not so resilient.

I can't get my father in Italy to do internet related work.

He doesn't want high speed internet at home.

It's either a little fear, a little resistance, or simply because it's packed with mechanics.

So designers try to tackle this particular discomfort that we have, this kind of discomfort, and try to make our lives easier.

Flexibility of mind is something we really need, we really need, we really value, we take seriously.

And this exhibition is about the work of designers to help us become more resilient, and also to the work of designers who are actually working with this resilience as an opportunity. One last thing, it includes scientists as well as designers.

Before we get into showing and previewing some slides, I'd like to point out this beautiful detail about the scientists and the design.

It can be said that the relationship between science and design goes back centuries. Of course, we can also talk about Leonardo da Vinci and many other Renaissance men and women. And there is a huge history behind it.

But according to the truly great historian of science you may know, Peter Garrison (he teaches at Harvard University), what nanotechnology and quantum physics in particular have brought to designers is a new interest, a real passion for design.

So basically, the idea that you can build things up, atom by atom, got everyone tinkering.

And suddenly scientists want designers, just as designers want scientists.

This is a whole new love affair that we are trying to nurture at MOMA. Together with Adam Brye, founder of Seed Magazine (now a multimedia company, as you may know), we set up a monthly salon for designers and scientists about a year ago. it was very beautiful.

And Keith came, Jonathan came, and so many others.

It was great, because at first it was this apology festival, the scientist said to the designer, "I don't know what style is, I'm not very elegant."

And the designer will think, "Oh, I don't know how to make an equation, I don't know what you're talking about." And suddenly they really started speaking each other's language and now they've already reached the point where they cooperate.

Physicist Paul Steinhardt from New York and architect Aranda Rush have collaborated on an installation at London's Serpentine.

And it's really interesting to see how this happens.

This exhibition tells the work of both designers and scientists, showing how they present us with the possibilities of the future.

We are currently showing you different sections of the show to give you a little taste.

Nanophysics and nanotechnology, for example, have really expanded the minds of designers.

In this case, I am further presenting the work of the designer. Because they are really inspired.

Many of the objects that appear in the show are concepts, not objects that already exist. But what you're looking at here is the work of UCLA scientists.

This kind of alphabet soup is a new way to mark proteins not just by color, but literally by alphabet.

So they can build it and build all sorts of morphologies at the nanoscale. It is the work of design students at the Royal College of Arts in London, who have worked with their tutor Tony Dunn and a number of scientists across the UK to explore the potential of nanotechnology in future design.

A new sensory element on the body -- you can grow hair on your fingernails and grab some particles from other people.

They seem very obsessed with wanting to know more about their ideal marriage partner.

So they work on enhancing everything from touch to smell to find the perfect mate.

Very interesting. It was designed by a type designer from Israel, who calls it "typosperma".

He's thinking of injecting a typeface into his sperm. Of course, this is all a concept. I don't know how to say it in English, but by injecting the sperm into the sperm, almost a song or a whole poem is written with each ejaculation. (Laughter) Let me tell you, the designers are very nice.

Tissue design.

Again, we have a mix of scientists and designers.

This is part of the same laboratory at the Royal College of Art, England.

From that perspective, RCA is a really great school.

One of the challenges of the year was working with extracorporeal meat.

You already know that meat can be grown in test tubes.

In Australia, a research firm called SymbioticA did just that.

But the problem is that it's really ugly putty.

So the assignment for the students was, "What shall we do with tomorrow's steak?"

If cows didn't have to be killed in any form, what would it look like?

So this student, James King, roamed the beautiful English countryside, picked the best cows he could find, and put them in an MRI machine.

Then he got the best organ scans and made meat. Of course, this was done in collaboration with a Japanese resin food manufacturer, but it could be further improved in the future. This is a reproduction of the best MRI scan of the best cow he found.

Instead, this element here is much more mundane.

What you can already do is grow bone tissue and literally make a wedding ring out of your loved one's bone tissue.

So this is indeed made of human bone tissue.

This is SymbioticA, which they have been working on so far. They were the first company to manufacture this extracorporeal meat. And now I also made an extracorporeal coat - a leather coat.

It's small, but it's a full-fledged coat. shaped like one.

This means that in the future there will be no excuses to wear everything in leather.

One of the most important topics of this show is that, like everything in our lives today, we can look at it from so many different perspectives and on so many different levels.

One of the most interesting and most important concepts is that of scale. We change scales often. Changing the screen resolution is not particularly confusing and is very comfortable.

So, even within the exhibition, you'll find everything from nanotechnology and nanoscale ideas to the manipulation of very large amounts of data, such as mapping and tagging the universe and the world.

In this particular case, the section is devoted to information design.

Here is Ben Fry's work. This is "human vs chimpanzee". Some chromosomes that distinguish us from chimpanzees.

What he created for Seed magazine was a beautiful visualization.

And this is the entire Pac-Man code, visualizing every go-to and go-back, and beautifully choreographed as well.

And a graph by a scientist, this beautiful diagram showing protein homology.

Scientists are also beginning to consider aesthetics.

This morning we had a discussion with Keith Shrubb\* about the fact that many scientists tend not to use beautiful things in their presentations. If I don't, I'm afraid they'll think I'm a stupid blonde.

So they choose the worst backgrounds, the worst typefaces from all kinds of PowerPoint presentations.

Only recently has this kind of fusion of design and science produced the first "beautiful" - you might say so - scientific presentations.

Another aspect of contemporary design that I think is open-minded, promising, and truly the future of design. That is the concept of collective design.

As you know, the whole XO laptop started with 'one laptop for a child' and is based on the idea of ​​collaboration, mashing and networking.

Therefore, the more, the more fun.

The more computers, the stronger the signal, and the children work with interfaces, so everything is based on doing something together or performing a task together.

In other words, the idea of ​​collective design will continue to grow in the future, and I picked this up as an example.

Collectiveness is the idea of ​​maximizing existence, related to the idea of ​​collective design and the new balance between individuality and collectivity.

This is a phrase I coined a few years ago thinking about how tense we are. At the same time, I thought about how these small objects, first Walkmans, then iPods, created bubbles of space around us, allowing us to have a metaphysical space much larger than our physical space.

You can have your own room inside your iPod, completely isolated on the subway.

This is the work of several designers who use various techniques to really enhance the idea of ​​solitude and expansion.

This is a spa phone. The idea is that it's getting very difficult to have private conversations everywhere, so you can go to the spa, get a massage, get a facial, maybe get a massage, in this beautiful pool at this perfect temperature, and have a phone conversation in this isolation tank with someone you've wanted to talk to for a long time.

The same thing here is social telepresence.

This has actually already been used a bit in the military, but the idea is that even though you are physically away from the military, you can still be somewhere else just by your senses.

And this is called a blind date. It's [unclear], so if you're too embarrassed to actually go on a date, bring flowers and keep your distance so someone else can reenact the date for you.

Rapid manufacturing is another big area where technology and design are changing the world, I believe. You've probably heard about it too many times.

Rapid Manufacturing is a computer file sent directly from your computer to the manufacturing machine.

Formerly called rapid prototyping, rapid modeling.

It started in the 80's, initially by machine-sculpting models from foam blocks, but they were too fragile to be used in practice.

Slowly but surely the material got better and better resin.

In addition to engraving, technologies such as stereolithography and lasers have improved to solidify all kinds of resins, whether powder or liquid. Then the tub got bigger and now we can make a real chair with rapid manufacturing.

It takes 7 days to manufacture a chair today. How about 7 hours in a day?

And my dream is to be able to customize my chair at home. As you know, companies and designers end up designing matrices and margins that respect both robustness and brand and design identity.

Then you can send it to Kinko's around the corner to pick up the chair. Now, the impact of this is not only on the end-buyer's participation in the design process, but also on tracking, warehousing, and no material waste.

I can also imagine that many design makers will need to rethink their business plans and perhaps invest in the Kinko's store. But it's a really big change.

Here's a picture that I've seen in Wired Magazine. You know, my favorite "Artifacts of the Future" section. This photo shows that you can print your own basketball using a desktop 3D printer.

But here is an example. You can already 3D print textiles. This is very interesting.

This is really cool. This is called slow prototyping.

A designer who put 10,000 bees to work created this vase.

They had a certain shape that had to stay there.

mapping and tagging.

As the capacities of computers become so great and the capacities of our minds less so, we find that we need to tag as many of our actions as possible in order to undo the path we have taken.

I also do it to share with others.

Again, this sense of common experience seems very important today.

Maps and different ways of tagging are therefore also the work of many designers today.

Also, the senses—the designers and scientists—are all working to extend the capabilities of our senses so that we can accomplish more.

And in a way, it also has animal sensibilities.

This particular object, beloved by many, is actually based on some sort of scientific experiment. What this means is that bees have such a strong sense of smell that they can be trained with the Pavlovian reflex to detect certain types of cancer and pregnancy, much like dogs can smell certain types of skin cancer.

So this student at RCA designed this beautiful blown glass object in which bees migrate from room to room when they detect a specific odor, which in this case means pregnancy.

Another shape is made for cancer.

Design for Debate is a really interesting new initiative that our designers have created themselves.

Some designers design object-based scenarios rather than designing the actual objects, products, and so on.

It's still very helpful.

They help companies and other designers think better about the future.

And they are usually accompanied by a video.

This is so beautiful. "All the Robots" by Dan and Rabby.

These are a series of robots that are meant to be taken care of.

We always think that robots will take care of us, but instead they designed robots that are in great trouble.

Before doing anything, you need to take it in your arms and stare at it for about five minutes.

The other gets really very nervous when he walks into the room and starts shivering so you have to calm it down.

So this is a way to make us think more about what robots mean to us.

Gnome Tran and "Accessories for Lonely Men": The idea that when you lose someone you love or go through a bad breakup, the things you miss most are the annoyances you hated when you were with them.

So he designed all these accessory series.

This will take your sheets away at night.

Then there's another thing that blows down your neck.

Some people throw plates and break them.

So this is an idea of ​​what we really miss in life.

Elio Caccavare: He took the idea of ​​a doll to explain leukemia.

He's been working on xenotransplantation and making dolls to explain spider genes in goats for several years.

He works on a series of puppet displays that explain to children where today's babies came from.

Because it is no longer mom, dad, flowers and bees and babies. No, it can be two mothers and three fathers outside the body. The whole way of thinking about how babies are made today has changed.

So that's the series of dolls he's working on now.

One of the coolest things is that the designers are taking technology into account, but actually addressing life.

And lately, many designers have been working on the concept of death and mourning, and what we can do about it today with new technology.

Or how we should behave regarding new technologies.

Those three objects over there are hard drives with Bluetooth connectivity. But they are actually very beautiful carved artefacts that contain the entire memory of someone's desktop and computer that has passed away.

So instead of just holding a picture, put this object next to your computer and suddenly Gertrude's entire life and all her files and address books come to life.

And this is even better. "Afterlife" by Auger-Roseau.

Some people don't believe in life after death.

So, in order to give you something tangible about what happens after death, the gastric juice of the deceased is taken, concentrated, and put into a battery that can actually be used to power a flashlight. The same goes for adult toys.

It's amazing how these things can make people laugh and laugh and sometimes cry.

But I hope this special exhibition can trace a new portrait of where design is headed. It's always, hopefully, a portrait of where the world was going years ago.

thank you very much.

Pollinator decline is a major challenge in the modern world.

Among the 200,000 species of pollinators, honeybees are the best understood, in part because of their long history with them, dating back 8,000 years to cave paintings in what is now Spain.

But we do know that this indicator species is going extinct.

Last year alone, 40 percent of all beehives in the United States were lost.

In areas with harsh winters, like here in Massachusetts, the numbers are even higher, losing 47 percent of beehives in one year alone.

Can you imagine if we lost half our workforce last year?

And what if they were food producers?

I can't.

And I predict that within 10 years there will be no bees.

Without the work of beekeepers replacing these dead hives, we would be without the foods we depend on: fruits, vegetables, crunchy almonds and nuts, sour apples, sour lemons.

Even the hay and alfalfa our cows depended on to eat is gone, causing global hunger, economic collapse and a complete moral crisis for the entire planet.

Well, I started keeping bees for the first time here on Cape Cod right after completing my PhD in bee immunology.

(Laughter) (Applause) Imagine getting a degree like this in a booming economy. And it was 2009, the time of the Great Recession.

And then I realized something.

I knew I could find a way to improve bee health.

So the Cape Cod community here in Provincetown was ripe for citizen science—people looking for ways to get involved and help.

So we met people at coffee shops.

A wonderful woman named Natalie got eight beehives in her home in Truro. She introduced us to her friend Valerie. She let us install 60 beehives on an abandoned tennis court on her property.

So we started testing a vaccine for bees.

We started looking at probiotics.

We named this "bee yogurt". It's a way to make bees healthier.

And our citizen science project started to take off.

On the other hand, when I returned to my apartment here, I was a little nervous about my landlord.

I thought I should tell him what we were doing.

(laughter) I was scared. I was going to get an eviction notice, but it was really necessary.

But it must have been a good day when I caught him. Because when I told him what we do and how we started a non-profit urban beekeeping lab, he said, "That's great! Let's build a beehive in a back alley."

I was shocked.

Totally surprised.

So instead of getting an eviction notice, we got another data point.

And what you see in the back alley in this image is this hidden beehive. That hive produced more honey in its first year than any other hive we have managed.

It changed our research perspective forever.

This changed our research question from "How do we save dead or dying bees?"

"Where are the bees happiest?"

And now I can put together a map by looking at all these citizen science beehives from people who have beehives on their decks, in their yards, on their company rooftops.

We started engaging with the public, and the more people who got these little data points, the more accurate our maps became.

So when you're sitting here thinking, "How can I get involved?"

You may recall the story of my friend Fred, a commercial real estate developer.

he was thinking the same thing.

He was at the conference thinking about what he could do for tenant relationships and sustainability at scale.

Then, during a tea break, I put honey in my tea and noticed that the honey jar had a corporate sustainability message written on it from the conference organizer.

And it came up with an idea.

he's back in the office.

An email came, a phone call came later, and—boom! -- We went all over the country together.

Dozens of beehives were installed on the rooftops of high-rise buildings in nine cities nationwide.

Nine years later -- (Applause) Nine years later, we've raised over a million dollars for bee research.

We have 1,000 small data points in 18 states nationwide with 1,000 beehives and growing. Local beekeepers (65 of them) have created paid jobs for those who are managing beehives in their communities, connecting with people, the public, and becoming data points for change.

So to explain what actually saves bees and where they thrive, we must first explain what kills them.

Pesticides such as insecticides, herbicides and fungicides are the top three killers of bees. There are many bee diseases. and habitat loss.

So we looked at maps to identify areas where bees were breeding.

We found this to occur mostly in urban areas.

Data now show that urban beehives produce more honey than rural or suburban beehives.

Urban beehives have a longer lifespan than rural or suburban beehives, and urban beehives have more biodiversity. Bee species are increasing in urban areas.

(laughs) Right?

why is this?

That was our question.

So we started with three people killing bees and flipped it over. Which of these would be different in a city?

The first is pesticides.

We have partnered with the Harvard School of Public Health.

We shared our data with them.

We collected samples from Citizen Science's beehives on people's homes and business rooftops.

We looked at pesticide levels.

We thought that areas where bees were doing well would use less pesticides.

it's not.

So what we found here in our research is that the orange bars are Boston and we thought those bars were the lowest, the lowest levels of pesticides.

And in fact, it is in the cities that the highest concentrations of pesticides are found.

In other words, isn't it the pesticide hypothesis that is saving bees, that is, reducing pesticides in urban areas?

This has often happened in my life as a scientist.

When I make a hypothesis, not only is it not supported, the opposite is true.

(Laughter) This is still an interesting discovery, isn't it?

we moved on.

disease hypothesis.

We looked for diseases throughout the beehive.

And a similar study in North Carolina found no difference between urban, suburban, and rural bee diseases.

Sickness is everywhere. The bees are sick and dying.

In fact, more bee diseases occurred in cities.

I was from Raleigh, North Carolina.

Again, my hypothesis was not supported. The opposite was true.

Move on.

(Laughter) Habitat hypothesis.

This means that areas where bees thrive have better habitats, i.e. more flowers, right?

But I didn't know how to test this.

So we had a very interesting encounter.

An idea sparked with my friend, colleague, and fellow TED speaker Anne Madden.

We thought about genomics like AncestryDNA and 23andMe.

Have you done these?

If you spit into a tube, you'll know "I'm German!"

(Laughter) Well, we developed this for honey.

So I took a sample of the honey, looked up all the plant DNA, and found out, "I am sumac!"

(Laughter) That's what we found here in Provincetown.

Only then can we report what kind of honey we have in our community.

HoneyDNA, a genomics test.

Provincetown spring honey comes from privet trees.

What is a privet tree? hedge.

what is the message?

Do not cut hedges to protect bees.

(Laughter) I know it's controversial because it's getting crunchy. So before we throw tomatoes, let's move on to summer honey, water lily honey.

When you get honey here in Provincetown in the summer, you're eating water lily juice. Sumac honey in autumn.

We learn about food for the first time.

Now, if you need to do city planning, you can report, "What's good to plant?"

Did you know bees are trying to do good to your garden?

For the first time in any community, we know the answer.

Even more interesting to us is the deeper part of the data.

So, if you're from the Caribbean and want to explore your own heritage, Bahamian honey made from the laurel family, cinnamon and avocado flavors is the perfect choice.

But what's even more interesting is that one teaspoon of honey contains 85 plant species.

That's the measure we want, big data.

Indian honey: it's oak.

The Indian samples we tested were all oak, which means there are 172 different flavors in one taste of Indian honey.

Provincetown honey grows from 116 plants in the spring to over 200 in the summer.

These are the numbers needed to test the habitat hypothesis.

Another citizen science approach is to research your food and get interesting data.

In rural areas today, honey samples were found to contain an average of 150 plants.

That's what rural areas do.

What do you think of suburban areas?

Are there fewer or more plants in suburban areas with lawns that look good to humans but are terrifying to pollinators?

Plant diversity is very low in the suburbs, so having a beautiful lawn is nice, but you can do more.

To diversify the habitat and improve pollinator health, a section of the lawn can be made into a wildflower pasture.

Anyone can do this.

Urban areas have the most habitats, with over 200 different plants, as seen here.

For the first time, we support the habitat hypothesis.

We also know how to work with cities.

The city of Boston has eight times better habitat than neighboring suburbs.

So if we work with governments, we can scale this up.

You might think my tombstone says, "Here lies Noah. Plant flowers." right?

In other words, doing all this is tiring.

But when we work together to scale, when we go to governments and city planners, like in Boston, most of the honey is linden trees, and we say, ``If you need to replace dead trees, consider lindens.''

When you turn this information over to the government, it allows them to do amazing things.

This is the rooftop of Fred's company.

They can be planted on rooftops around the world to begin restoring habitats and securing food systems.

We have worked with the World Bank and the Presidential Delegation of the State of Haiti.

We have worked with Yale University and some amazing graduate students from Ethiopia.

In these countries, we can increase the value of honey not only by identifying what it is, but by educating people on what to plant to restore habitat and secure food systems.

But what I think is more important is when you think about natural disasters.

For the first time, we see how baseline values ​​can be measured for habitats before they are destroyed.

Think about your hometown.

What risks does the environment pose?

This is how Puerto Rico will be saved after Hurricane Maria.

We now have baseline measurements of honey before and after the storm: honey DNA.

We started in Humacao.

This is where Hurricane Maria made landfall.

And by triangulating the honey DNA sample, we know which plant to replace in what amount and where.

At this point, you might want to think about the beautiful land that has brought us together and inspired us, the citizen science in the first place, the erosion, the winter storms that grow stronger year after year.

What will we do with this precious land of ours?

Honey's DNA tells us about plants that have deep roots, can secure land, and are good pollinators for everyone to participate with.

And the solution will fit in a teaspoon.

If your homeworld could be washed away or destroyed by a natural disaster, we now have a interrupted blueprint in time for how to restore it on Earth, or perhaps even a greenhouse on Mars.

It may sound crazy, but think about this: New provincetowns, new homes, familiar places that are good for pollinators to ensure a stable food system, when thinking about the future.

Now, together, we know what is saving bees by planting diverse habitats.

Now we know how bees can save us. By becoming a barometer of environmental health, a blueprint, a source of information, a small data factory that stalls over time.

thank you.

(applause)

We all know this story.

In the summer of 1950, Enrico Fermi, an Italian-American physicist and reactor builder, had lunch at the Los Alamos National Laboratory, joined several colleagues, and asked, "Where are they all?"

Clearly, his colleagues were perplexed by this as they were sitting there with him.

And he had to clarify that he was not talking about them.

He was talking about aliens.

As you know, this was just a few years after the alleged crash of a flying saucer in Roswell, New Mexico.

And when it turned out to be nothing, nothing at all - (laughter) - just a meteorological balloon dropped, piloted by little hairless men with slits in their mouths...

Still, America was mad as a saucer, even the famous scientists who were eating lunch.

Fermi's reasoning, paraphrased badly, is that the universe is reasonably vast, so there must be other intelligent life there.

And the universe is so old that unless we were the first civilization to evolve, we should have some evidence of its existence by now.

Yet, as far as we know, we are lonely.

"Where's everyone?" Fermi asked, but his colleagues didn't answer.

Fermi then, with the same blunt logic, denied the possibility of fairies, sasquatch, gods, love, and then, as you know, Enrico Fermi dined alone.

(Laughter) Now, I'm not a scientist.

I have never built an atomic pile.

However, technically, one might argue that all piles are atomic.

(Laughter) But, out of respect, I would like to point out two possibilities that Enrico Fermi probably didn't consider.

One is that aliens can be very far away.

Perhaps on other planets as well.

Another possibility is -- (laughter) -- that perhaps Enrico Fermi himself was an alien.

(Laughter) Think about it.

Isn't it a bit convenient that out of nowhere in the middle of World War II, Italian scientists emerged with an amazing new technology that would change everything in the world and darken the history of mankind forever?

And isn't it a little strange that he didn't demand payment for this?

All he asked for was a gift of two healthy sperm whales?

It's—it's not true.

But it's a wonder.

(Laughter) And if Enrico Fermi really was an alien, wouldn't he be the first to try to convince his fellow scientists that aliens aren't here anymore?

Because in certain ufology and ufology circles, aliens are already here and thought to have been for thousands of years. They roamed among us in disguise, watched us, guided our evolution from ape to man--if you believe such things--and sometimes kidnapped us in flying saucers and took us away to have sex in the pyramids.

(Laughter) It's a theory that's hard to discount, but I think you'll agree.

(Laughter) Because even in my own life, I have memories that are difficult to explain. Because it was such a bizarre, unexplained bizarre occurrence that it was hard to imagine it not being the result of prolonged and frequent alien contact over the course of my lifetime.

Because how else can I explain the amazing and absolutely true encounters I have had and which I am about to describe?

Encounter 1: 1980, Ocean City, New Jersey.

A special edition of Close Encounters of the Third Kind was released this summer.

Then I went on vacation to the Jersey coast with my parents.

Within 12 hours, I was badly tanned, like Richard Dreyfuss in the movie.

(Laughter.) So I spent most of the rest of my vacation sitting outside my little rented house on the sidewalk, still warm in the sun at night, looking up at the sky and watching UFOs.

what did i see? Stars, satellites, flashing planes - typical sky junk.

Occasionally, children would come and watch with us, but soon their necks would hurt and they would go out on the promenade to play video games and interact with humans.

I was pretty good at video games. I wasn't very good at other parts, so I was alone with Cosmos.

And then it happened.

An old couple came walking down the street.

I think they were in their late 70s and were on a date. Because he wore a very neat little suit with a yellow tie, a brown suit.

And she was wearing a cardigan. For it was already night, and a chill came in from the sea.

For some reason, I remember that they were exactly the same height.

And they stopped and the man turned to me and said, "What are you looking for, flying saucer?"

(Laughter) I have to admit that for an old man on a date, this is a pretty good piece of detective work.

But even stranger, even as a 9-year-old kid at the time, I noticed that they didn't stop at all.

How could this old man interrupt a moonlit walk with his lover for the very reason of teasing a child?

"Oh," he said, "green little men."

And his girlfriend also joined.

"There is no such thing as aliens," she said.

"No way."

And they both laughed. "Hahaha."

I looked around.

The streets were completely empty.

I no longer hear the sound of the sea.

It was as if time had stopped.

I didn't understand why they were making fun of me.

I remember wondering if they were wearing rubber masks as I peered into their strangely angry faces.

(Laughter) So if there was a rubber mask, what was behind it?

Huge, almond-shaped, unblinking eyes?

A slit in your mouth?

The old man bent his fingers like he was firing a gun and let out a laser noise.

"Cue, cue, cue -- watch out."

And they quickly turned and walked away.

The old man reached out for the woman's hand with a knotted nail, found it, and left me alone.

Now, you could say that this is just a misunderstanding, a strange encounter between humans.

Maybe it was swamp gas, but -- (laughter) -- I know what I saw.

Close Encounter 2: Brookline, Massachusetts, 1984.

When I went to see the movie "Dune", a girl talked to me. Now, on the surface -- (laughter) -- I understand this is seemingly impossible -- but it's absolutely true.

Unsurprisingly, it was opening night.

I went with my friend Tim McGonigal who was sitting to my left.

To my right was the girl in question.

She had long, curly black hair and wore a blue jean jacket.

I remember she had some kind of injury to her ankle and was wearing Ace bandages and on crutches.

I think she was very tall.

I had just started high school at the time. I think she was a junior, but I had never seen her before. She didn't go to my school.

I didn't know her name and never will.

She was sitting with what she believed to be her mother, discussing the novel Dune.

They were both huge mother and daughter fans. Very rare.

They were talking about their favorite character being a giant sandworm.

And it got weird.

Then she turned to me and said, "Are you looking forward to seeing the movie?"

(Laughs) First of all, I was embarrassed because I hadn't read the novel "Dune" at the time.

I was, and still am, just a fan of movies about desert planets.

(Laughter.) But that was also the tone of her question. It was as if he didn't care about the answer, as if he just wanted to talk to me.

I didn't know what to say. of course. "

I didn't even shake my head.

The movie has started.

Not to mention, this was David Lynch's version of Dune, and all the characters were sexy and deformed at the same time.

(Laughter) There was a character called the third-tier guild navigator, who was a giant floating embryo-like creature that lived in a giant aquarium with an orange mist of psychedelic spice swirling around him that could bend time and space.

He was never able to exit the tank or interact with the outside world.

Isolated, he became so deformed and sexy that he had to communicate with the outside world through something like an old-fashioned radio, never to touch the outside world.

I mean, I liked him a lot more than Sandworm.

Sandworm was fine, but what's your favorite character?

please.

When the movie ended, everyone got up very happy and left the theater as quickly as possible.

Except girls.

Her pace slowed as I walked away.

It was probably crutches, but apparently -- (laughter) -- she wanted to talk to me again.

It sounds pretty silly when said aloud, but I can only come to the conclusion that it's what the alien abduction victim community calls "screen memories," i.e. silly false memories that their brains create to mask some sort of trauma, such as memories of being abducted and flown down a sex pyramid.

(Laughter) So I'm really glad I didn't slow down talking to her.

I am so glad I never saw her again.

Close Encounter 3: Philadelphia, Pennsylvania, 1989.

In the mid-to-late 80s, novelist Whitley Strieber wrote a book called Communion, in which he described his lifelong experience of being abducted by aliens.

And he also explained a phenomenon known in this community as "time loss". Whitley Strieber suddenly finds that he can't remember the last ten minutes, the last ten hours, or the last ten days.

And then come to the conclusion that that's when the aliens were taking him in and giving him a rectal probe.

(Laughter) The book was, of course, a huge bestseller.

This image by Ted Joseph was from that book and was like a police sketch depicting the creature's appearance as described to him by Whitley Strieber.

And it was a huge success and made into a movie.

And in 1989, as I recall, I was in Philadelphia visiting my girlfriend and out of nowhere decided to go see this movie.

From my recollection, the movie covered these details.

1: Whitley Strieber was played by Christopher Walken.

2: The alien was played by a rubber doll.

(Laughter) Three: The movie had a surprisingly long sequence in which a rubber doll gives Christopher Walken a rectal probe.

4: This was playing in a regular movie theater in Center City, Philadelphia.

5: So they made a movie out of the book Communion, starring Christopher Walken.

Does anything seem strange about this?

is something wrong? Is there anything wrong? Is there something wrong with this photo?

please think about it. yes. The answer is "I had a girlfriend". what?

(Laughter) How did this happen? when did this happen?

I remember walking out of the theater hand in hand and suddenly realizing this fact and thinking the exact same question.

And to this day I cannot answer you.

Close Encounter 4: Portugal, Algarve, 1991.

A few years later, me and this woman - I'll call her "Katherine Fletcher" - (laughs) - traveled together in the south of Portugal.

We stayed in old, crumbling walled cities, in tiny little hotels, climbed to rooftops, drank vinho verde, watched the sunset and played checkers.

what? did we do this? TRUE? does anyone do this?

We went to some topless beaches.

excuse me? No, not in my life.

Naturally, we went to Sagres, considered the end of the world at the time.

There I was chased by a pack of stray dogs on the wharf, bitten on the buttocks by a guide dog, and had to go to an unknown Portuguese clinic to get an injection in the buttocks.

Make it what you want.

(laughs) On our last day in Portugal, we were in Faro, the provincial capital, and Catherine decided she wanted to go to the beach one last time.

She explained that Faro is now a small, bustling city and to get to the beach you have to take a bus and then a boat.

And did you want me to go with you too?

But I was exhausted and had been bitten by a dog so I said no.

I remember how it was before she left.

Freckles grew and multiplied on her face and shoulders, hardened like a kind of sunburn.

Sunburned, we both got sunburnt -- is this true?

As a result, her eyes became much brighter and bluer.

she was smiling.

She was a single woman trying to travel alone to a country where she didn't speak the language, taking a bus and a boat to a beach she didn't know or see.

I loved her, but then she left for that strange foreign land.

It took me a while to come to my senses.

I myself have had moments where I “lost time”. When I woke up, it was very late in the day, almost dinner time, and I suddenly realized that she hadn't come back.

Feeling uneasy, I went out into the street to look for her.

Well, I didn't speak Portuguese.

I didn't know where the beach was.

I couldn't call her on my cell phone. Because this was 1991 and the aliens hadn't given us that technology yet.

(Laughter) I realized that I could only think of two outcomes that day. Either Katherine returns to the hotel, or she doesn't.

So I sat and waited.

I was looking at the edge of the street, not empty, but with buses, cars, pedestrians and small scooters.

And I wanted to watch those constellations change and see her face as they parted.

In that very small town of about 30,000 people, it was at this point that I really appreciated the vastness of the universe and the exploration we were able to do within it.

And then came the Liberians.

Five young people - all laughing, happy, traveling together, returning to this hotel where they stayed.

One of them was named Joseph and he asked me what I was doing so I explained.

And he said, "Don't worry." He was sure Catherine was safe.

But as he sat with me waiting, he seemed less confident.

And for the next two hours they all waited with me. They took turns going to their rooms and back, making jokes to distract me.

Two hours later they gave me a message.

we are not alone.

And mid-sentence, just as dusk was about to set in, I turned and looked down the street.

The stars are aligned and she's back.

she was smiling. She couldn't understand why I was so worried.

The Liberians weren't the same, but there was a great sense of relief in their laughter as they patted us back to our rooms and left us alone on the road holding hands.

Events like this leave scars in your memory, just like having a piece of alien technology inserted into your buttocks by a "Portuguese doctor".

(laughter) And even now, ten and a half years later, when we're married, I still look for her whenever she's not in the room.

And I think you'll agree, maybe she was kidnapped and replaced by an alien clone while she was gone, but I love her and I'm still waiting for her.

thank you for listening.

(applause)

We live in a world increasingly dominated by screens, mobile phones, tablets, TVs and computers.

We can have any experience we want, but feel nothing.

You can make lots of friends, but no one shakes hands.

I want to take you to another kind of world, the world of imagination. There, with this most powerful tool we have, we can change our physical surroundings, but in doing so, forever change the way we feel and the way we feel about the people with whom we share the earth.

My company, Artichoke, which I co-founded in 2006, was founded to create moments.

We all have moments in our lives, but on our deathbed, we don't remember taking the 38 bus to work each day, or struggling to find a parking space when we went to the store each day.

We will remember those moments when our kids took their first steps, when they were selected for the football team, when they fell in love.

In short, Artichoke exists to use the imagination of an artist to create moving, ephemeral moments that change the physical world and show us what is possible.

We create beauty in ruins.

We revisit our history.

We create moments that everyone can witness and participate in.

For me it all started in the 1990s when I was appointed festival director in the small English city of Salisbury.

You've probably heard of it.

Here is Salisbury Cathedral, and the world-famous Stonehenge monument nearby.

Salisbury is a city that has been ruled by the Church, Conservatives and the military for hundreds of years.

It's a place where people love to follow the rules.

So, in my first year in the city, imagine me running late and going the wrong way on a one-way street.

I'm always late

It's strange that you came today.

(laughter) A little old lady on the sidewalk kindly shouted at me.

Fascinatingly, I thought, "Oh, I know."

"I hope you die!" she cried.

(Laughs) And then I realized that this is where I'm having trouble.

A year later, persuading, negotiating, and doing whatever it took to get the work done.

It wasn't a classical concert in a church or a poetry reading, it was a work by a French street theater company, performing Faust's story "Mephistomania" on stilts with hand-held fireworks.

The next day, the same little old lady stopped me in the street and said, "Was it your fault for last night?"

I backed off.

(Laughter) “Yes.”

"When I heard about it, I knew it wasn't for me.

But Helen, it was. ”

So what happened?

Curiosity overcame suspicion, joy overcame fear.

So I wondered how I could transfer these ideas to a bigger stage and started traveling to London to do something similar.

Please try to imagine. This is a world city.

Like most of our cities, it specializes in labor, trade and transportation.

It's a machine to get work done on time and back on time, and we're all complicit in wanting to fix the routine so everyone knows what happens next.

But what if this amazing city could be turned into a stage, a platform for something unimaginable that would somehow change people's lives?

In England we often do this.

No matter where you come from, you should be doing it.

This is the Horse Guards Parade.

And this is what we often do. It's always about winning things.

It could be a marathon, a war win, or a cricket team coming home victorious.

close the street Everyone applauds.

But for theater? Impossible.

The exception is a story told by a French company. It's a story about a little girl and a giant elephant who came to play for four days.

And all I had to do was convince the public authorities that it was perfectly normal to shut down the city for four days.

(Laughter) No traffic, just people having fun, coming out to marvel and witness this extraordinary artistic endeavor by the French theater company Royal du Luxe.

It was a seven year journey. I said to a group of men sitting in a room, ``Well, it's like a fairy tale about a little girl and this giant elephant.

And they said, 'Why are you doing this?

for what?

Are you celebrating the president's visit?

Is it an agreement between France and England?

Is it for charity? are you trying to raise money? ”

And I say, "Nothing like that."

And they will say, "Why are you doing this?"

But four years later, this magic trick, this extraordinary thing happened.

I sat at the same conference I've been attending for four years and said, "Please, can I ask you a favor?"

Instead, they didn't say "please".

I said, "This thing that we've been talking about for a long time is happening today, and I really want your help."

Something magical happened.

For some reason, everyone in the room assumed that someone had said yes.

(Laughter.) (Applause.) They decided that they weren't being held accountable, or that they were being held responsible for bus detour planning, council officials were being asked to close roads, and Londoners' transport was being reorganized on the Underground.

All these people were only expected to do what they could to help us.

No one was held accountable.

And I naively thought, 'Well, I'll take responsibility' for the million people that ended up on the streets.

It was our first show.

(Applause.) This was our first show, but it changed the nature of cultural viewing live and on the street, not in galleries and theaters and opera houses, and changed public spaces for the widest possible audience, people who never bought a ticket to see anything.

So we were there.

We're done, but we've continued to make this kind of work.

The company's efforts are astonishing, but even more surprising is the fact that they got permission to do so.

And security is nothing.

And this was nine months after the horrific bombings that tore London apart.

So I started wondering if I could do something like this in a more complex situation.

We have focused on Northern Ireland, the northern part of Ireland, depending on your perspective.

Here is a map of England, Scotland, Wales, Ireland and the island on the left.

It's been a land of conflict for generations, a mostly Catholic republic in the south and a mostly Protestant supporter community, hundreds of years of conflict, and more than 30 years of British troops on the streets.

And now there is a peace process going on, and this is the city that Loyalists call Londonderry today, and Catholics Derry.

But everyone calls it home.

And I started wondering if there was a way we could address tribalism in our community through art and imagination.

This is what each community does every summer.

This is a bonfire filled with statues and insignia of those you hate on the other side.

This is also true from the loyalist community.

And every summer they burn them.

they are in the center of town.

So we looked here, to the Nevada desert, and to Burning Man. People also have bonfires there, but they have a completely different set of values.

Here you can see the work of David Best and his extraordinary temple, built during the Burning Man event and burned on Sunday.

So we invited him and his community to come and recruit young people, the unemployed, people from both sides of the political and religious divide, people we wouldn't normally see or talk to.

Their extraordinary work has resulted in a temple that rivals the city's two cathedrals, one Catholic and one Protestant.

But this was a non-religious temple for all, for the community, but for everyone.

And put it in this place where everyone said no one would come.

It was too dangerous. It was between two communities.

I just kept saying, "But it's got such a great view."

(Laughter) And again the same old question: why aren't we doing this?

Pictured is the beginning of 426 elementary school students climbing the hill by a principal who didn't want to miss the opportunity.

And just like what happens in the Nevada desert, the temperatures varied slightly, but the people of this community, 65,000 of them, were writing their grief, their pain, their hopes, their hopes for the future, their love.

Because after all, this is only about love.

They live in a post-conflict society. Post-traumatic stress is high and suicide rates are high.

And yet for this brief moment – ​​and it would be absurd to think it was more than that – someone like Kevin – a Catholic whose father was shot upstairs in his bed when he was nine – Kevin came to work as a volunteer.

And he was the first to hug an elderly Protestant woman who walked in through the door on the day the temple was opened to the public.

it rose. It was left there for 5 days.

And we have chosen those to burn it from among the small group of non-denominational builders who have given their lives in recent months to build this extraordinary object.

And here is the moment when 15,000 people gathered on a dark and cold March night and decided to forget their animosity and live in this shared space. There was an opportunity to say what no one could say and say out loud, "You hurt me and my family, but I forgive you."

And together they watched members of the community let this thing go. It's such a beautiful thing, but it was just as hard to let go of as the thoughts and feelings that went into making it.

(music) Thank you.

(applause)

So, during the run-up to the 2016 election, I, like most people, witnessed increasing discord, bitterness and discomfort in public spaces.

It was this extraordinary increase in polarization.

It was both discouraging and painful.

So I started thinking with fellow journalist Jeremy Hay about how we could practice our craft differently.

If we go to the heart of divisions and places of conflict, as journalists do all the time, and go there, how can we do something completely different?

We wanted to do something new with the core tools of our technology: careful scrutiny of information, diligent research, curiosity, and service to the common good—service to democracy.

So we planned this process, which we called dialogue journalism, to get to the heart of the social and political divide and, once there, build journalism-fueled conversations between people on opposite sides of a polarizing issue.

But how do we actually do this in a world so divided and so deeply divided? In a world where cousins ​​and uncles and aunts cannot speak to each other, we often live in separate and disparate news ecosystems, reflexively and habitually slandering and excluding those with whom we disagree.

But we wanted to try.

So in the immediate aftermath of the 2016 election and in the period between the election and the inauguration, we partnered with the Alabama Media Group to do something very different.

We brought together 25 Trump supporters from Alabama and 25 Clinton supporters from California.

Then we gathered them into a privately moderated Facebook group and kept them public for a month.

What we wanted to do was give them a place to work with genuine curiosity and openness.

And we wanted to help them build their relationship, not just with each other, but with us as journalists.

And we wanted to provide facts and information—facts and information that they could actually receive, process, and use to underpin their conversations.

So, as a prelude to this conversation, as a first step in so-called dialogue journalism, we asked what the other person thought of us.

So when I asked Trump supporters in Alabama what Clinton supporters in California thought of them, here are some of their answers:

"They think we're religious Bible powerhouses."

"That we are backward, mean and stupid."

“They think we all have Confederate flags in our yards and are racist, sexist and uneducated.”

"They think we're barefoot, pregnant, and on a dirt driveway."

"And they think we're all fucking bastards, walking around in hoop skirts against a backdrop of cotton fields."

And we asked the Californians the same question. "What do you think Alabama people think of you?"

And they said, "We are crazy, liberal Californians."

"That we are not patriotic."

“We are snobs and we are elitists.”

"We don't believe in God, so we are generous with children."

"And it means we're focused on our careers, not our families."

“That we are elitists, rich intellectuals, eat Whole Foods, and are very insane.”

So by asking questions like this at the beginning of every conversation and identifying and sharing stereotypes, we see people, people from all walks of life, start to realize the simple and often mean caricatures they have.

And then you can move on to the real conversation process.

Therefore, in the two years since the launch of the California/Alabama project, we have hosted dialogues and partnerships with media organizations across the country.

And they were about some of our most controversial issues: guns, immigration, race, education.

And surprisingly, what we discovered is that true dialogue is indeed possible.

And many, if not all, of our compatriots will want to engage with other nations if given the opportunity and the structure to do so.

All too often, journalists sharpen disagreements in the name of drama, readership, or to serve our own views.

And all too often, we've quoted partisan voices on one side and partisan voices on the other with compelling anecdotal leads and core final quotes on each side, all of which readers attempt to explore prejudices.

But our dialogue-based process is slower-paced and different-centered.

And our work is guided by the principle that dialogue across differences is essential for democracy to work, and that journalism and journalists have a multifaceted role in supporting it.

So how does it work?

At every step, we are as transparent as possible about our methods and motivations.

At every stage, we take the time to answer people's questions and explain why we do what we do.

We tell people it's not a trap. No one says you're stupid, and no one says your experience doesn't matter.

And we constantly seek to change patterns away from a completely different kind of behavior, a reflex slander that is so entrenched in speech that most of us in all walks of life don't even realize it anymore.

That's why people often come into our conversations a little mad.

They say things like "How can you believe X?"

"How can you read Y?"

"Can you believe this happened?"

But in general, in this miracle that pleases us every time, people begin to introduce themselves.

And they start explaining who they are, where they're from, and they start asking each other questions.

And slowly, over time, people come back to difficult topics again and again, each time with a little more empathy, a little more nuance, a little more curiosity.

And our journalists and moderators are working hard to support this. Because this isn't a debate, a fight, or a Sunday morning talk show.

It's not jumping to the point.

It's not a stack of memes and GIFs or an article with a headline that proves the point.

And it's not about winning political victories in the question trap.

So what we've learned is that a state of discord is bad for everyone.

It's a very unfortunate state of affairs.

And people tell us this over and over again.

They said they appreciated the opportunity to be involved with respect, curiosity and candor, and were happy and relieved to have the opportunity to put their arms down.

So while our work directly challenges the current political climate of the country, we know that engaging and supporting people from opposite backgrounds in conversation can be a difficult and rewarding task.

And we know that democracy depends on our ability to address common issues together.

And we do this work by putting community at the center of the journalism process, putting our egos aside, listening first, listening deeply, listening through our own biases and habits of thought, and supporting others to do the same.

And we do this knowing that journalism as an organization struggles and that it has always had and will continue to play a role in facilitating the exchange of ideas and views.

Many of the participants in our group have long-lasting aftertaste.

Beyond political affiliation, many people are friends on Facebook and in real life.

After finishing the first Trump/Clinton project, about two-thirds of the women created their own Facebook groups, with moderators from each state, to continue discussing difficult and challenging issues.

People tell us over and over that they are grateful for the opportunity to be part of this work, they are grateful to know that the people on the other side aren't crazy, they are grateful for the opportunity to connect with people they wouldn't otherwise talk to.

Despite the fact that we call ourselves Spaceship Media, much of what we have seen and learned is not rocket science at all.

If you name people badly, label them, or insult them, they won't listen to you.

Snark doesn't help, shame doesn't help, condescension doesn't help.

Authentic communication takes practice and effort, self-discipline and self-awareness.

There is no algorithm that solves where we are.

Because real relationships are really real relationships.

So lead with curiosity, focus on arguments, not arguments, and break out of silos. Because there is a true connection that transcends differences...

This is the salve our democracy desperately needs.

thank you.

(applause)

So 2014 was a big year for me.

Have you ever had a big year or a great year?

In my case it went like this: On October 3rd, I lost my second pregnancy.

On October 8th, my father passed away from cancer.

Then on November 25, my husband, Aaron, died of stage 4 glioblastoma, three years later. It's just a fancy word for brain tumor.

That's why I have fun.

(Laughter) People ask me out all the time.

crowded social life.

Usually, when I talk about this time in my life, the response is basically something like this: (sighing) "I can't do that, I can't imagine it."

But I think we can.

I think we can.

And I think you should because one day it will happen to you too.

Maybe this particular order or speed does not result in a particular loss, but like I said, I have a lot of fun and the research I see will surprise you. Anyone you love has a 100% chance of dying.

(Laughter) So you came to TED.

(Laughter) (Applause) Ever since these losses happened, I've made it my job to talk about death and loss. I talk not only about myself, but also about the loss and tragedy that other people have experienced because it is so easy to summarize.

I have to say it's a niche.

(Laughs) It's a small niche, so I wish I could make more money...

(Laughter) I've written some very uplifting books, hosted a very uplifting podcast, and started a small nonprofit.

I'm just trying to do everything I can to make more people feel comfortable with being uncomfortable, but grief is very uncomfortable.

Especially when it is someone else's grief, it is very unpleasant.

Part of that effort is this group that I started with my widowed friend Mo. We call it "Hot Young Widows Club".

(Laughter) And it's real, we have membership cards and t-shirts.

And when your person dies, it literally doesn't care if your husband, wife, girlfriend, boyfriend, you were married. Your friends and family will hunt around through friends of friends of friends until they find someone who has gone through something similar. And they push you to each other so that you don't transfer your grief to others and can talk to yourself alone.

(Laughter) That's what we do.

It's a series of small groups where men, women, gays, straights, marrieds, and those with partners can talk about the deceased and what other people in their lives aren't ready to hear or don't want to hear yet.

A huge range of conversations.

"My husband passed away two weeks ago and I can't stop thinking about sex. Is that normal?"

yes.

"What if it's one of the real estate brothers?"

Unusual, but acceptable.

(Laughter) "You know, when you go out in public and see old people holding hands, or couples who have obviously been together for decades, you see them and you imagine all the things they've been through together, the good and the bad, the arguments about who should take out the trash..."

I just realized that my heart was filled with anger. ”

(Laughter.) And that example is personal to me.

Most of the conversations we have in groups can and will continue to be within ourselves, but some of what we are talking about could be really beneficial for the rest of the world, a world bordering on grief but not yet grief-stricken, to hear.

In case you don't know, I'm only interested in non-scientific research and can't do it, so I went to the Hot Young Widows Club and asked, "Hello friends, do you remember when your person died?" they did

"Remember all the things people told you?"

"oh yeah."

"Which one did you hate the most?"

We got a lot of comments, a lot of answers, people had a lot of things to say, but two people quickly climbed to the top.

"Move on."

Well, since 2014 I have been remarried to a very handsome man named Matthew. We are a mixed family with four children and live in the suburbs of Minneapolis, Minnesota, USA.

We have a rescue dog.

(Laughter) I drive a minivan that you can't touch when the door opens.

(laughter) Likewise, life is good in any 'mejour'.

I have never said "mejule", nor have I ever said that.

(laughs) I don't know where that came from.

(Laughter) I've never heard anyone else say that.

It seems that there is no help for it even if you say so, so English is garbage ....

(Laughter) I'm very impressed with people who speak it in addition to meaningful language. Well done I think.

(Laughter) But no matter how you look at it...

(Laughter) By all appearances, life is very, very good, but I'm not "moving on."

I haven't moved on and I hate that term so much and I understand why others do.

Because what's written there is that Aaron's life and death and love are but a fraction of a second that I can and probably should.

And I always found myself weird because when I talk about Aaron, I get into the present tense so quickly.

And then I realized that everyone does.

It is not because we are in denial or because we are forgetful. Because the loved ones we lost are still present before us.

So when I say, "Oh, Aaron is..."

Because Aaron is still there.

And it's not the way he used to be, and it's not the way people in the church try to tell me he would be so much better before.

But he is indelible and exists for me.

Here, he exists for me in the work I do, in the children we have had together, in the three other children I am raising. They never met him and don't share his DNA, but are present in my life just because I had Aaron and I lost Aaron.

Aaron's life and love and death made me the person Matthew wanted to marry, so he's a part of me and Matthew's marriage.

So I didn't walk away from Aaron, I moved forward with him.

(Applause.) We scattered Aaron's ashes in his favorite river in Minnesota. And when the bag was emptied, the ashes were still stuck to my fingers, because they fit in a plastic bag when cremated.

And I could have put my hands in the water and washed them off, but instead I licked my hands clean. Because I was so scared of losing more than I had already lost, and because I was desperate to make sure he was always a part of me.

But of course it will.

Because when you see someone poisoning themselves for three years so that they can live with you for a little longer, it sticks in your mind.

It sticks in your mind when you see him go from being healthy the night you met him to nothing.

When you see a son, not yet two years old, on his last day of life approaching his father's bed as if he knew what would happen in a few hours and saying, "I love you. It's all done. Bye-bye."

It will stay in your heart.

Just like when you fall in love, eventually, when I catch you and look at you, you're even more like, 'Oh my God, I was wrong all along.

Love is not a contest or reality show. So quiet, even when everything is in chaos, when things are falling apart, when he is gone, this invisible thread of serenity binds us both together. ”

It will stay in your heart.

We used to do this - my hands were always freezing, but he was so warm that I would take my ice-cold hands and push his shirt up...

Press them against his hot body.

(Laughter) And he hated it so much (Laughter) But he loved me, and after he died, I lay in bed with Aaron and put my hands under him and felt his warmth.

And I don't even know if my hands were cold, but I can only say that I knew this was the last time for me.

And that those memories will always be sad.

Those memories will forever hurt.

Even if I'm 600 years old, even if I'm just a hologram.

(laughs) Just like the memory of meeting him always makes me laugh.

Sadness does not occur in this vacuum, but with or mixed with all other emotions.

So I met my now husband, Matthew. He doesn't like that title [laughs], but it's very accurate.

(Laughter) I met Matthew...

I heard a sigh of relief among those who loved me, like, "It's over!"

she did it

She got a happy ending, we can all go home.

And we did good. ”

And the story was so fascinating to me that I thought maybe I could understand it too, but I didn't.

Got another chapter.

And it's a very good chapter -- I love you honey -- it's a very good chapter.

But it seemed like another world, or one of those old 'choose your own adventure' books from the '80s with two parallel plot lines, especially at first.

So I opened up to Matthew and my head was like, "Why don't you think about Aaron?"

Past, present, future, just get in there” and I did.

And suddenly, with these two plots unfolding simultaneously, falling in love with Matthew made me realize the enormity of what I had lost in Aaron's death.

And just as importantly, it helped me understand that my love for Aaron and my grief for Aaron and my love for Matthew are not opposing forces.

They are just strands of the same thread.

they are the same thing.

I... what would my parents say?

I'm not special

(Laughter) They had four kids, and frankly they were like this.

(Laughter) But I'm not, I'm not special.

I am fully aware that terrible things are happening all over the world every single day.

all the time.

As I said earlier, I am a fun person.

But terrible things are happening and people experience deeply formative and traumatic losses every day.

And part of my job is this weird podcast I have where I tell people about the worst things that ever happened.

And sometimes it's the loss of a loved one, sometimes days, weeks, years, and even decades ago.

And the people I'm interviewing don't keep this loss to themselves, they don't make it the center of their lives.

They lived on, their world kept spinning.

But they were talking to me, a total stranger, about their dead loved ones. Because these experiences give us character and make us as much as pleasant experiences.

And just as permanently.

Long after I got my last condolence card or my last hot meal.

Similarly, we see people around us experiencing the joys and wonders of life and we don't say 'move on', do we?

I don't send cards like 'Congratulations on your sweet baby' and then five years later you think 'Birthday party again?

(Laughter) Okay, he's five.

(laughs) Wow.

(Laughter) But grief is like falling in love or having a child or watching HBO's The Wire, you don't know until you understand it, until you do it.

And once you do it, if it's your loved one or your baby, if it's your grief, front row at the funeral, you understand it.

You understand that what you are going through is not momentary, you are touching something chronic, not bones that reset.

something incurable.

It's not fatal, but sometimes it feels like grief can be fatal.

And if we can't prevent it from each other, what can we do?

What can we do but remind each other that some things cannot be repaired and not all wounds heal?

We need to remind each other and help each other remember that grief is a complex emotion.

that you can and will be sad and happy. You will be able to grieve and love in the same year or week, in the same breath.

We must remember that those who are sad will smile and smile again.

If you are lucky, you may find love again.

But yes, definitely, they intend to move forward.

But that doesn't mean they moved forward.

thank you.

(applause)

You may be wondering why I wear sunglasses, and one answer to that is because we're here to talk about attractiveness.

So I think we all know what attraction is. here it is.

Attractive movie stars like Marlene Dietrich.

There is also a male figure, which is very attractive.

Not only can he shoot, drive and drink, he also drinks wine. There's actually a little wine in it, but of course I'm always in a tuxedo.

But I think attractiveness actually has a broader meaning. That's true of movie stars and fictional characters, but it's also in other forms.

magazine?

Well, it certainly isn't this one.

This is the least attractive magazine on newsstands. It's all about sex tips.

Sex tips are not attractive.

And Drew Barrymore is also irresistible, despite her great charm.

But it also has an industrial appeal.

This is the work of Margaret Bourke-White. It's one of her pictures.

Fantastic and captivating pictures of steel mills and paper mills and all sorts of fascinating industrial areas.

And then there's the mythical allure of the garage entrepreneur.

This is the Hewlett-Packard garage.

We know that everyone who starts a business in a garage ends up founding Hewlett-Packard.

I have a fascination with physics.

What could be more fascinating than understanding the universe as a whole, the Grand Unity? By the way, if you're Brian Green, it helps. He has a different kind of charm.

And, of course, there is this attraction.

This is very, very attractive. It's the charm of outer space. It's a nice, clean version of the early '60s, not alien-inspired glamour.

So what does attractiveness mean?

Well, if you want to know what grammar means, you can look it up in a dictionary.

And looking up a very old dictionary, in this case from 1913, actually helps even more.

Because for centuries the word attraction has had a very special meaning, and the word has actually been used differently than we think.

You had a "charm".

It was not an attraction in nature. You "cast a charm".

Glamor was literally a magic spell.

It is not a figurative one as we use it today, but a literal magical spell associated with witches and gypsies and to some extent Celtic magic.

And over the years, beginning about the early twentieth century, we have adopted this definition of another kind of deception, an artificial interest in an object and an object that seems delusionally magnified or glorified by it.

But still, attraction is an illusion.

Glamor is a magical spell.

And there's something dangerous about attraction through most of history. When witches cast a spell on you, it was not for your benefit, but to make you act against their own interests.

Of course, in the 20th century, glamor took on another meaning in relation to Hollywood.

And this is Hedy Lamarr.

Hedy Lamarr said, "Anyone can look attractive. Just sit there and look stupid." (Laughter) But actually, in honor of Headey, and we'll hear more about him later, there's a lot more than that.

The creation of this Hollywood glamor was accompanied by a huge amount of technical achievements.

There were a lot of retouchers, lighting experts and makeup experts.

Visit the Hollywood Museum of History in Hollywood to see special rooms painted in different shades according to the complexion of the star Max Factor makes up.

Thus, a highly stylized portrait, though not entirely terrestrial, was completed. It was a star portrait.

And indeed, we see glorified photos of stars all the time. They call it false color.

Charm is a form of disguise, but a disguise to achieve a particular purpose.

It may be to light up the stars. Maybe to sell movies.

And it requires very advanced techniques.

It's not -- it's not glamorous -- you don't wake up glamorous in the morning. I don't care who you are

Even Nicole Kidman doesn't wake up glamorous in the morning.

There is a process of “idealizing, beautifying, dramatizing”, and it is not limited to people.

Glamor doesn't have to be a person.

Architectural Photograph -- Julius Shulman, who spoke of the transformation, took this stunning and famous photograph of the Kaufmann House.

Architectural photography is very attractive.

It takes you into this special special world.

This is Alex Ross' comic art, and as part of his style he gives comic art a kind of realism, which makes it look very real.

However, light doesn't work this way in the real world.

Putting people side by side makes the people in the background look smaller than the people in the foreground, but it's not a glamorous world.

What is glamor -- this is from the New York magazine table of contents blurb that glamor is back -- glamor is about transcending the mundane.

And I think we're starting to understand what the core of it is that combines all sorts of attractions.

This is a portrait of Saint Apollonia painted by Filippino Lippi in 1543.

I don't even know who she is, but this is the equivalent of a [16th] century supermodel.

A very glamorous portrait.

Why Glamorous?

First, because she is beautiful. But it doesn't make you attractive, it just makes you beautiful.

She is graceful, mysterious, and transcendent, and these are the core qualities of attraction.

I can't see her eyes they are facing down.

She's not looking away from you, but you have to imagine her world in your head.

She invites you to ponder this higher world to which she belongs. There she can remain completely silent while holding iron instruments meant to torture to death.

Mel Gibson's 'Passion Of The Christ' – unglamorous.

It's charming. It is Michelangelo's "Pieta". Maria is the same age as Jesus and they are both very happy and having fun.

Charm invites us to another world.

It has to be mysterious and a little distant at the same time. That's why in these glamorous shots, the person is often not looking at the audience, which is why sunglasses are so appealing. But at the same time, it must not be so high above us that we cannot identify with it.

In a way, there must be other beings like us.

So, as I say, God is not attractive in religious art.

God cannot be attractive because He is all-powerful and all-knowing, being far beyond us.

In religious art, however, saints and the Virgin Mary are often, but not always, depicted in ornate figures.

As I said earlier, attraction doesn't have to be about people, but it has to have this transcendental quality.

What about Superman?

One of Superman's hallmarks, aside from Alex Ross's style, which is very appealing, is that it makes you believe that humans can fly.

Glamour is about transcending the world to reach an ideal and perfect place.

This is one of the reasons transportation tends to be so attractive.

The less experience you have with them, the more attractive they become.

In other words, you can beautify photos of cars, but you can't beautify photos of traffic.

You can take beautified pictures of the plane, but not inside.

The concept is that it transports you, and this story, you know, is not about this nasty little man with a little kid in front of you on a plane, or a big cough.

A story is where you get to, or what you think about where you get to.

And this sense of movement is one of the reasons why we have such attractive styling.

This kind of streamlined style is appealing not only because it reminds us of the films of that era, but also because it takes us out of the ordinary with that streamlining.

Similarly, arches are very attractive.

The arch with stained glass is even more gorgeous.

The staircase that curves away is attractive.

To me, what makes that staircase photo so appealing is that it captures all of academic and contemplative life. But maybe it's because I went to Princeton.

Anyway, the skyline is very attractive, but the city streets are not so attractive.

When you actually come to this town, there is reality there.

The horizon, the open road, is very, very attractive.

Few things are more captivating than the horizon. Except maybe multiple horizons.

Of course, you don't feel cold or hot here. I just see possibilities.

It needs a sprezzatura, the hallmark of the Renaissance, to bring out the charm. Sprezzatura is a word coined by Castiglione in his book The Courtier's Book.

There is a less ornate version of what it looks like today, centuries later.

And sprezzatura is the art of hiding art.

It makes things look effortless.

No idea how Nicole Kidman wears that dress, she just looks perfectly natural.

And I remember reading an article about Angelina Jolie going home all black and all blue after the Lara Croft movie.

Of course, Lara Croft did all the same stunts too, so they covered it up with makeup, but she has sprezzatura so she doesn't turn black and blue.

"Hiding all art and making it appear as though what was done or said was done without effort": And this is one of the key aspects of attraction.

Glamor is editing.

How do you create the feeling of transcendence, the feeling that evokes the perfect world?

The feeling that life could be better, that I could be part of this world, that I could be the perfect human being, that I could be part of this perfect world.

I won't give you all the dirty details.

Well, this is what Jeff Bezos kindly lent me from last year.

This is under Jeff's desk.

This is what the real world looks like for computers, lamps and all kinds of electrical appliances.

But if you look at catalogs, especially those of modern and beautiful objects for the home, you'll see:

No code.

Please take a look next time these catalogs arrive in the mail. You can usually tell where the code was hidden.

But there is always the illusion that if you buy this lamp, you can live in a cordless world. (Laughter) And the same applies. Whether you buy this laptop or this computer, even in the wireless age, you can't live in a cordless world.

There must be mystery and grace.

And there she is - Grace.

I think this is the most charming photo ever.

Part of the question in "Rear Window" is is she too attractive to live in his world?

The answer is no, but of course this is just a movie.

Hedy Lamarr is back again.

And, as you know, this kind of head covering is very attractive because, like sunglasses, it hides and exposes at the same time.

Transparency is attractive. That's why people wear pearls.

That's what makes barware so attractive. Glamor is translucent. Neither transparent nor opaque.

It invites us into the world, but it doesn't give us a perfectly clear picture.

And if Grace Kelly is the most attractive person, I suspect that a spiral staircase with glass blocks is probably the most attractive interior shot. Because spiral staircases are incredibly attractive.

You have a sense of going up and away, but you never think about what would happen if you actually stumbled, especially when going down.

Of course, the glass block also has a sense of transparency.

So while this session is supposed to be about pure pleasure, attraction actually has meaning.

Every individual and every culture has ideals that are unattainable in reality.

They are contradictory and uphold principles that are mutually exclusive. Whatever it may be, these ideals give meaning and purpose to our lives as cultures and as individuals.

And the way we deal with it is by replacing them - we put them in the Golden World, the Imaginary World, the Age of Heroes, the World to Come.

And in our personal lives we often associate it with some object.

White picket fence, perfect house.

The Perfect Kitchen -- In the perfect kitchen, there are no bills on the counter.

You know, when you buy a Viking Range your kitchen looks like this.

A perfect love life -- symbolized by a perfect necklace and a perfect diamond ring.

The perfect car for the perfect vacation.

An interior design company literally called utopia.

Perfect office. As far as I know there is no code.

Sure, no, it doesn't look like my office.

In other words, there is no paper on the desk.

We want this golden world.

And some people, in a sort of domestic sense, have a perfect world if they get rich enough and have their own ideals.

Dean Koontz built this amazing home theater, and I don't think it's a coincidence, it's in the Art Deco style.

It symbolizes feeling safe and at home.

This is not necessarily a good thing. Because what would your perfect world be?

What are your ideals and edited?

something important?

The Matrix is ​​a movie that has it all.

You can talk a whole lot about "The Matrix" and attraction.

It was criticized for glorifying violence. Because, with sunglasses and a long coat, you can of course walk and climb walls and do all sorts of things that are impossible in the real world.

Another photo of Margaret Bourke-White.

This is from the USSR. attractive.

I mean, look at how happy people are and how good they look.

As you know, we are heading towards utopia.

I'm not a PETA fan, but I think this is a great ad.

Because what they're doing is telling you that your coat isn't that attractive, and that the parts that have been edited out are important.

But really, more important than remembering what was edited is asking, "Are ideals good?"

Because the attraction can be very totalitarian and deceptive.

And it's not just a matter of glamorizing floor cleaning.

This is from "Triumph Of The Will". It's a great edit that cuts things off.

You have a charming shot.

National Socialism is all about charm.

It was a very aesthetic ideology.

It was all about purifying Germany, the West, and the world, stripping them of anything unattractive.

Therefore, attraction can be dangerous.

I think charm has real charm and real value.

I'm not against pomp.

But there is a certain wonder about what gets edited in the code of life.

And there are both ways to avoid the dangers of attraction and ways to expand your perception of attraction.

It's about following Isaac Mizrahi's advice and standing up to all that manipulation, and admitting that manipulation is something we enjoy, but also about enjoying how it happens.

And this is Hedy Lamarr.

She's very attractive, but you know, she invented spread spectrum technology.

So even if you think you might look stupid, knowing she wasn't really makes her more attractive.

David Hockney talks about how much the appreciation of this irresistible painting goes up given the fact that it took him two weeks to paint this splash.

There are books in the bookstore. It's called "Symphony in Steel" and it's about what's hidden under the skin of the Disney Center.

And it's charming.

It's not necessarily glamorous, but there's a certain charm to revealing that charm.

There is a wonderful book called "Crowns". It features all the glamorous photos of black women wearing church hats.

And then there's a quote from one of these women, she says, "When I was a little girl, I admired women in church with beautiful hats.

She was a beautiful doll who looked like she had just stepped out of a magazine.

But I also knew how hard they had worked all week.

Sometimes there's a lot of joy and a lot of sorrow under that hat. ”

And indeed, understanding what happened to create attraction makes that attraction even more understandable.

thank you.

Hello brains!

I say that because when you think about it, you weren't actually the one who decided to come here today.

it was your brain.

And whether you walk, drive, take a taxi, or ride a bike is determined by your brain.

Behavior, all behavior is influenced by the brain.

This is my brain story.

I mean, I was a smart kid.

By 18 months, I was able to speak in complete sentences.

By the time I was in the third grade, I was able to get a score after graduating from high school on a standardized test.

I had great potential, as all my teachers agreed.

I struggled too.

I had very few friends outside of books.

I was easily overwhelmed. I spaced out during class.

I was always missing things.

And trying to focus my brain on something I wasn't excited about was like nailing jelly to a wall.

But I was smart and no one cared.

When I entered middle school and was responsible for attending classes on time and remembering to bring homework, I realized that being smart was no longer enough and my grades started to drop.

My mother took me to the doctor and after a comprehensive examination I was diagnosed with ADHD, attention deficit hyperactivity disorder.

For those unfamiliar with ADHD, there are three main characteristics of ADHD: inattentiveness, impulsivity, and hyperactivity.

Some people with ADHD have a lot of inattentive expressions.

They are dreamers, space cadets.

Some people have more symptoms of hyperactivity and impulsivity.

These children are usually diagnosed early.

(Laughter) But the most common presentations are a combination of both.

(Laughter.) My doctor and my parents decided that, given my shiny new diagnosis, if spankings and lectures failed, meth might work.

So I tried it and it worked.

When I took the medicine for the first time, I felt like I could see without wearing glasses and squinting.

I was able to concentrate.

And without changing anything, my GPA went up by 1 point.

Honestly, it was kind of miraculous.

When I turned 14, I had a friend who liked me.

By age 15, I had my first poem published.

I got a boyfriend.

By the time I was 17, I knew I wanted to be a journalist.

My local college had a program that guaranteed admission to USC.

They had a really great journalism program.

So I enrolled in a local university and started taking classes.

I moved in with my boyfriend.

Things were going well, but they are no longer.

I started having difficulty getting to class on time.

I completed a statistics course, but I forgot to register by the deadline, so I didn't get any credits.

I took a class to help my boyfriend with his career, but I completely lost myself.

I never went to USC.

By age 21, I had dropped out of college and moved back home.

Over the next 10 years, I started, quit, or was laid off from 15 jobs.

I have damaged my credit.

I got married but got divorced less than a year later.

At this point I was 32 and had no idea what I was doing with my life other than reading self-help books that didn't help.

What happened to that possibility?

Was I not trying? no! I worked harder than anyone I know.

I didn't even have time to spend with my friends.

I was so busy.

It had potential.

So my failure was clearly my fault.

I just wasn't doing what I was supposed to do to get there, and to be honest, I was tired of trying harder and harder in life than others.

At this point, I could have given up on myself or decided that everyone who thought I had potential was wrong.

But I didn't. Because I knew it was my behavior that got me here, and that behavior is influenced by the brain, and my brain is ADHD.

Looking at my behavior, I realized that ADHD still interfered with my life, even though I was on medication and as an adult. What I needed to know was why, how and what I could do about it.

I started doing some research and found a lot of great information.

I also found a lot of bad information, but that's another story.

But there is also good news.

Websites, podcasts and talks by researchers and medical professionals. It would have been far more helpful than any self-help book I had ever used, written for an apparently normal neurotypical brain.

However, many of the books I found seemed to be highly specialized or written for parents and teachers trying to deal with children with ADHD.

There wasn't much that seemed aimed at those of us with ADHD.

So, I started a YouTube channel.

I had no idea how to start a YouTube channel, but I started a YouTube channel.

That was all I knew at the time, and I would have called it "how not to get ADHD."

But my boyfriend Edward got me off of it.

It turns out that many people, perhaps especially those who actually have ADHD, need help understanding ADHD.

I was no exception.

I thought ADHD was the same for everyone.

I thought it was mainly for distraction.

I thought having ADHD might be the reason I was failing in life.

And I realized that I needed to change myself in order to be successful.

Even though I didn't succeed, I am still who I am.

Spoiler: I was wrong.

So let's take a step back and get back to what brought us here today: the brain.

It turns out that understanding the brain you're using is kind of important. Whether that brain is an employee's brain, a student's brain, a child's brain, a lover's brain, or one's own brain.

ADHD affects 5-8% of the world's population. So, statistically speaking, there are 37 to 60 people in this room alone.

I don't know who they are just by looking, but it's fun to watch them challenge themselves.

(Laughter) So, at some point, you will meet someone with ADHD, work with them, have a baby, or fall in love.

You may already have one.

And at some point, you're going to ask yourself, "What's going on in their brains?!"

So, after two years of learning about ADHD, a lifetime of experience so far, and the privilege of connecting with researchers, doctors, ADHD experts, and tens of thousands of ADHD brains around the world, what can we say to make sense of ADHD?

By the way, many of them cooperated with this lecture.

First of all, it's real.

It's not about bad parenting or lack of discipline.

ADHD is a neurodevelopmental disorder.

It is currently the most well-studied mental condition, and it actually makes measurable differences in the brain.

These differences are greater in children, but for most people they never go away.

This means that adults also have ADHD.

ADHD diagnosis rates are on the rise, but it's not because of more sugar, more technology, or a lack of butt-slapping habits. Just like some people drown in swimming pools because of Nicolas Cage, they don't.

Correlation is not the same as causation.

These are real numbers.

(Laughter) This is due to a greater understanding that ADHD exists, that girls, adults, and gifted students can also become ADHD, and ironically, a lack of understanding that being overly sensitive or misbehaved or struggling in school does not mean you have ADHD.

ADHD is more serious than I thought.

The main characteristics of inattentiveness, impulsivity and hyperactivity don't sound that serious, nor did I think they were, but in real life they mean people have more accidents, are more likely to be fired, get divorced, and are significantly more likely to suffer from addiction.

I learned that ADHD is on the spectrum.

Raise your hand if you've ever lost your keys or left your seat in the middle of a lecture.

If you don't raise your hand, I'll assume you leave a space in the middle of this.

(Laughter) The problem is that everyone can experience symptoms of ADHD, but the actual diagnosis is based on how many of those symptoms seriously and chronically interfere with different aspects of life.

In the same way that being sad doesn't lead to depression, being distracted may not lead to ADHD.

And just like you can have mild depression or severe depression, ADHD can range from mild to severe.

I also learned that ADHD is a terrible name for ADHD.

It causes a lot of confusion.

We are not lacking in attention!

We have a problem with regulating our attention.

As ADHD coach Brett Thornhill says, it's like your brain keeps switching between 30 different channels, but someone else has the remote control.

Sometimes we can't concentrate at all, and sometimes we get stuck in the channel. In real life, it may seem like you prefer playing video games and not doing homework. Simply put, sometimes it is.

However, in reality, there are many things that we cannot concentrate on, even though we want to and are trying to do so.

Current understanding is that this problem has to do with the way our brain produces and metabolizes neurotransmitters such as dopamine and norepinephrine.

Did you know that ADHD is highly treatable?

Stimulants increase these neurotransmitters, which makes you more focused.

It is highly effective in approximately 80% of ADHD patients.

I also learned that medication alone is not enough.

ADHD affects more than our ability to concentrate.

Executive functions such as planning, prioritizing, and the ability to keep working toward goals are impaired.

It affects our ability to regulate our emotions, behavior and sleep.

No one program in our brain works differently. It's the entire operating system.

It can affect every aspect of our lives.

And there are many strategies that can help.

Cognitive-behavioral therapy, coaching, and even meditation and regular exercise can make a big difference in understanding your brain.

I knew I had trouble concentrating, and I knew medication would help with that.

What I didn't know was that constant overwhelm was associated with poor working memory, and making a list helped. Or maybe the reason I've always been late wasn't because I didn't care, but because people with ADHD have a distorted sense of time, and maybe a timer could tell me how long it really takes.

Most of the time I expected to learn what I actually learned. ADHD is real. It is important to deal with it. And drugs alone are not enough.

What I didn't expect to learn: that I wasn't alone. I was ADHD. How much difference would connecting with it make?

There are people with ADHD in every country and every culture in the world.

Yes, even in France.

(Laughter) And this tribe is great.

Comparing myself to people with neurotypical brains made me really disgusted with myself.

Why couldn't I just wait until the last minute to keep my house clean or finish my project on time?

But seeing the positives in my fellow ADHD brains helped me recognize and appreciate my own strengths that I couldn't see just by looking at my weaknesses. I have been doing so for decades.

But ADHD brains have a lot to offer the world.

We tend to be generous, funny, and creative.

People with ADHD are 300% more likely to start their own business.

We don't just think outside the box. We often don't even realize there is a box.

(Laughter) We might struggle if our brains aren't working, but the ADHD brain excels at tackling urgent tasks, working on new ideas, tackling difficult problems, and devoting ourselves to projects of personal interest.

The YouTube career I stumbled upon was all of them.

At 32, I was divorced, miserable and had no idea what I was doing with my life.

At 33, I started my own business and had connections with ADHD professionals.

At 34, I now have a team of volunteers helping out with the channel.

I am engaged to this wonderful man. He helped me build my channel, worked with me and is now making slides. And, as we discovered, he also has ADHD.

(Laughter) I'm trying to get schools to work so that kids don't have to wait until they're 32 to learn about their brains.

And I'm here today to give you my first TEDx talk.

(cheers) (applause) But wait! There's more! Wait.

(Applause.) That sounded like the end of the speech. Sorry, but it's not.

(Laughter) I am happier and more successful than I have ever been in my life.

what happened? How did you reach your potential?

Three things: One, I learned about my brain—the ADHD brain—by ​​myself and by connecting with others with ADHD.

If you judge a fish by its ability to climb trees, it will spend its entire life believing it to be stupid, unless it happens to converse with another fish and realize that fish are not very good at climbing trees. It's okay, there are many oceans.

Second, while learning about my brain, I was able to find and encounter a job that utilizes my brain.

If you spend all your time getting fish to climb trees, you will never know how far they can swim.

I have found that I can be myself and still be successful.

I just had to find my own ocean.

Third, I learned strategies for the challenges I still face.

Sorry, I can't compare this to a fish.

(Laughter) I think I learned how to swim.

Once you understand what your brain's challenges are, you can find solutions to them.

Beyond stereotypes and assumptions about people with ADHD, dig deeper and discover what ADHD really is.

Not someone who never stops being fidgety or distracted.

A chronically under-arousal brain is trying to get the basic level of stimulation that all brains need.

It is not procrastination or indifference.

Defective executive functions make it difficult to start.

And it's not that people are lazy or don't try hard enough.

It is children and adults who struggle to succeed in a society that is not built for them, with brains that do not always want to cooperate.

Society is our instruction manual.

We learn how our brains and bodies work by observing the people around us.

And if you do it differently, you might feel like you're broken.

So what I'm trying to do is reach out to these people anywhere in the world and tell them, "You're not crazy. You're not stupid."

No need to try harder. You are not the failed version of normality.

You are different, you are beautiful, and you are not alone. ”

Even if you don't have ADHD yourself, chances are you know someone with ADHD.

They are your employees, your bosses, your friends in this room.

I hope this talk will help you understand them better.

If you have ADHD, welcome to this tribe.

(Applause) (Cheers)

This session is about the wonders of nature and the larger conference is about the pursuit of happiness.

I would love to combine them all. Because to me healing is the ultimate wonder of nature.

Your body has the amazing ability to start healing on its own much faster than people once realized, simply by stopping the behavior that is causing the problem.

And in fact, much of what we do in medicine and in life in general revolves around mopping floors without turning off the faucet.

i love doing this job Because this job really gives a lot of people new hopes and new options that they didn't have before. This job allows me to talk not only about diet, but also about not being happy. We're talking about the pursuit of happiness, but when you really look at all the spiritual traditions that Aldous Huxley called "eternal wisdom," it really matters when you get past the names and formalities and rituals that divide people. Our nature is to be happy. Our nature is to be peaceful and healthy.

So happiness is not something you get, health is not something you generally get, rather all of these different practices are important. As you know, the ancient swamis, rabbis, priests, monks, and nuns did not develop these techniques just to manage stress, lower blood pressure, or clear arterial blockages. Even if it makes everything possible.

They are powerful tools for transformation, for quieting our minds and bodies so that we can experience what it feels like to be happy, to be at peace, to feel joy, and to recognize that it is not something we pursue and get, but rather something we already have until we get in the way of it.

I studied yoga for many years with a teacher named Swami Satchidananda.

People will say, "What are you, a Hindu?"

(Laughter) It's about identifying the things that interfere with our natural health and well-being and allowing them to heal naturally.

To me that is a true natural wonder.

So, within that larger context, we can talk about diet, stress management, or spiritual practices. We can talk about moderate exercise, quitting smoking, support groups and communities (more on this later), and some vitamins and supplements.

People tend to think that the diet I recommend is very strict.

You need it to turn the disease around.

But if you just want to get healthy, you have a variety of options.

If you can move in a healthy direction, you will live longer, feel better, and lose weight.

And what we have been able to do in our research is use very expensive, high-tech, cutting-edge measures to prove how powerful these very simple, low-tech, low-cost, and in many ways ancient interventions are.

We started by researching heart disease.

When I started this business 26 or 27 years ago, people thought that once you had heart disease, it would only get worse.

What we discovered was that in many cases, instead of getting worse and worse, it could get better and better, much sooner than people once realized.

This is a representative patient who, at age 73 at the time, was told he needed a bypass and decided to have a bypass instead.

Stenosis was demonstrated using quantitative arteriography.

This is one of the major arteries feeding the heart and you can see it narrowing here.

After a year, it's still not clogged. Usually it goes in the opposite direction.

These small changes in obstruction can improve blood flow by 300%, and using cardiac positron emission tomography (PET) scans, blue and black indicate no blood flow, orange and white indicate maximum blood flow, and can make a big difference without drugs or surgery.

Clinically, he could not walk across the street without experiencing severe chest pain.

Like most people, within a month he was pain free and within a year he was climbing over 100 floors a day with the Stairmaster.

This is not uncommon and is part of the reason why people are able to sustain this type of change as it makes a huge difference in their quality of life.

Observing all arteries in all patients, the comparison group showed progressive deterioration from 1 to 5 years.

This is the natural history of heart disease.

But it's not really natural. We have discovered that things can get better and better much sooner than people think.

It wasn't because of their age or illness, it was because of how much they had changed.

The oldest patients improved as did the younger patients.

A few years ago, we received this Christmas card from a patient in one of our programs.

My brother is 86 years old. The older person is 95 years old.

They wanted to show me how flexible they are.

The next year they sent me this and I thought it was funny.

(Laughter) You never know.

And what we found was that it stopped or reversed the progression of heart disease in 99% of patients.

Well, I thought that if we did good science, medical practice would change.

But it was naive.

It's important, but not enough. Because we doctors are trained to work for pay and to work for pay. Therefore, changing insurance means changing medical practice and medical education.

Bypass surgery and angioplasty are covered by insurance, but diet and lifestyle were not covered until recently.

So we started training in hospitals across the country through our nonprofit labs and found that most people could avoid surgery.

And not only was it medically effective, but it was also cost-effective.

Insurance companies have found they are beginning to save about $30,000 per patient. Medicare is in the middle of a demonstration project right now, paying for the program for 1,800 people at the facility where we train.

The fortune teller said, "We give smokers a discount because they don't have much to say."

(Laughter) I love this slide. Because it's an opportunity to talk about what really motivates people to change and what doesn't.

What doesn't work is the fear of dying, and that's what it's usually used for.

Anyone who smokes knows it's not good for you.

Yet 30 percent of Americans smoke, and 80 percent in some parts of the world.

Because it helps them get through the day.

We'll talk more about this later, but the real epidemic is not just heart disease, obesity and smoking, but loneliness and depression.

They are always there for me and no one else.

Are you going to steal 20 of my friends? what will you give me ”

Or you eat when you're depressed, use alcohol for pain relief, work too much, or watch too much TV.

There are many ways to avoid, numb, or avoid pain, but the point of all these is to address the source of the problem.

Pain is a symptom, not a problem.

And telling people "I'm going to die" is too scary to think, or "I'm going to have emphysema or a heart attack" is too scary to think about so I don't think about it.

This was the most effective anti-smoking ad.

And the headline says "impotence," not "emphysema."

What was the best-selling drug of all time when it was released a few years ago?

Viagra, right? why? Because many people need it.

It's not like saying, "Joe, I have erectile dysfunction. How about you?"

Nonetheless, look at the number of prescriptions being sold.

It's not a mental one, it's a vascular problem, and nicotine constricts your arteries.

So are cocaine, high-fat foods, and emotional stress.

In other words, the very act of being sexy in our culture leaves many feeling tired, lethargic, depressed, and helpless.

But when you change these behaviors, as I have shown, you have more blood in your brain, more clarity in your thoughts, more energy, and more blood in your heart.

Improves sexual function.

This is a research result. Consuming a high-fat meal causes a noticeable decrease in blood flow within an hour or two.

And you probably experienced this at Thanksgiving, too.

How do you feel when you eat a lot of greasy food?

After that, I kind of get sleepy.

Many of you have children and we know that there is a big change in your lifestyle.

People aren't afraid to make big lifestyle changes if it's worth it.

And there's the paradox that making big changes yields big benefits and makes you feel better right away.

For many, these are worthy choices for living better, not for living longer.

I want to say a few words about the obesity epidemic. It really matters.

Two-thirds of adults are overweight or obese, and diabetes in children and 30-year-olds has increased 70 percent over the past decade.

I'm going to show you this, and it's from the CDC.

These are not election returns. These are the percentages of overweight people.

And if you look at '85-'86, '87, '88, '89, '90, '91, you get a new category of 15-20 percent. '92, '93, '94, '95, '96, '97 -- New categories added. 98, 99, 00, 01.

In Mississippi, over 25% of people are overweight.

why is this? Well, it's one of the most effective ways to lose weight -- (Laughter), but the problem is that it doesn't last.

(Laughter) Well, there is no mystery about how to lose weight. Either you burn more calories through exercise, or you consume fewer calories.

Well, one way to reduce your calorie intake is to eat less. So any diet can help you lose weight if you eat less or restrict entire food categories.

Another way is to change the type of food.

Also, fat has 9 calories per gram, while protein and carbohydrates have only 4 calories.

Therefore, reducing your fat intake will reduce your calorie intake without eating less.

That means you can eat the same amount of food, but you'll be taking in fewer calories because the food has a lower calorie density.

And it's the amount of food, not the type of food, that affects how full you feel.

I don't like to talk about the Atkins diet, but I get asked a lot, so I'll take a few minutes to talk about it.

The myth you're hearing is that Americans are being told to eat less fat, the percentage of calories from fat is decreasing, and Americans are fatter than ever, so fat doesn't make you fatter.

It's half true.

So the percentage is lower, but the actual amount is higher, so the goal is to reduce both.

Dr. Atkins and I had many discussions before he died, and we agreed that Americans were eating too many simple carbs, or "bad carbs."

These are things like (laughs) sugar, white flour, white rice, and alcohol.

And you suffer the double whammy of taking in all the calories that don't fill you up because you've removed the fiber, and they're quickly absorbed, causing your blood sugar to spike.

The pancreas produces insulin to replace the calories. This is a good thing, but insulin promotes the conversion of calories to fat.

So the goal is not to go for pork skins, bacon and sausage (these are not healthy foods), but to turn from "bad carbs" to "good carbs".

Fruits, vegetables, whole grains and brown rice are rich in fiber in their natural form.

Fiber helps you feel full before you consume too many calories, slows absorption and prevents blood sugar spikes.

And you can take all the substances that prevent disease.

You are protected not only by what you exclude from your diet, but also by what you ingest.

Not all fats are bad for you, just like not all carbs are bad for you. Contains good fats.

These are mainly called omega-3 fatty acids.

For example, it is found in fish oil.

Bad fats are things like trans fats in processed foods and saturated fats in meat.

If you remember nothing else on this story, consuming 3 grams of fish oil a day can reduce your risk of heart attack and sudden death by 50 to 80 percent.

They come in 1 gram capsules. It just adds extra fat that you don't need anymore.

It also helps reduce the risk of most common cancers such as breast, prostate and colon cancer.

The problem with the Atkins diet, as anyone who has lost weight on the Atkins diet knows, is that you can lose weight with amphetamines and phenphenes as well. There are many ways to lose weight that are not good for you.

We want to do it in a way that promotes health, not harms it.

The problem is that it is based on this half-truth. Americans eat too many simple carbs, so eating less will make them lose weight, and eating whole, lean foods will make them gain even more, making them healthier rather than healthier.

He says, "I have good news.

Cholesterol levels haven't changed, but research has changed. ”

(Laughter) So what does the Atkins diet do to your heart?

Red is nice. first and one year later.

This is from a study published in the peer-reviewed journal Angiology.

A year on the diet I recommend will increase redness, but a year on the Atkins diet will reduce redness and reduce blood flow.

Sure, I lose weight, but my heart is not happy.

One study funded by the Atkins Center found that 70 percent of people had constipation, 65 percent had bad breath, and 54 percent had headaches. This is not a healthy way to eat.

So you might start losing weight and start drawing people to you, but if they get too close it's going to be a problem.

(Laughter) And more seriously, there is now a case report of a 16-year-old girl who died of bone disease, kidney disease, etc. after several weeks on the Atkins diet.

And that's how your body eliminates waste through breathing, bowels, and sweat.

So when you follow a diet like this, you start to smell bad.

The optimal diet is low in fat, low in bad carbs, high in good carbs, and sufficient in good fats.

And again, this is the spectrum. Going in this direction will help you lose weight, feel better and be healthier.

Not to mention the ethical concerns people have, there are also ecological reasons for eating lower down the food chain, whether it's deforestation in the Amazon or making more protein available to four billion people living on $1 a day.

As such, there are many reasons to eat like this, besides health.

We are now working with Sloan Kettering and UCSF to publish the first study examining the effects of this program on prostate cancer.

We included 90 men with biopsy-proven prostate cancer who chose not to undergo surgery for reasons unrelated to the study.

You can also randomly divide them into two groups and then compare one group as a no-intervention control group. You can't do that with breast cancer, for example, because everyone receives treatment.

After a year, it was found that none of the patients in the experimental group who made these lifestyle changes required treatment, while six of the patients in the control group required surgery or radiation therapy.

When the PSA level, a marker for prostate cancer, was examined, it worsened in the control group, but improved in the experimental group.

And the difference was very significant.

I was wondering, is there a relationship between how much people change their diet and lifestyle, regardless of which group they belong to, and changes in their PSA?

And sure enough, the heart study found a dose-response relationship, just as it does for arterial occlusion.

And I had to make big changes to lower my PSA.

Then I wondered if I was just changing the PSA and not really affecting tumor growth.

When they added it to a standard line of prostate tumor cells grown in tissue culture, it inhibited growth 70% vs. 9% in the experimental group seven-fold more than the control group.

Finally, I wondered if there was a relationship between the degree of change in people, regardless of which group they belonged to, and how much tumor growth it suppressed.

And this really got me excited. Because we found the same pattern again. So the more people change, the more it affects tumor growth.

Finally, MRI and MR spectroscopy scans were performed on some of these patients.

Tumor activity for this patient is shown in red and clearly shows improvement as PSA declines after 1 year.

If that applies to prostate cancer, it almost certainly applies to breast cancer as well.

These changes may also reduce the risk of recurrence, regardless of whether people are receiving conventional treatment.

In connection with the question of the pursuit of happiness, the last thing I would like to say is that the lonely and depressed person is another true epidemic in our culture, but study after study has shown that depression is also many times more likely to get sick and die prematurely. One reason is that, as I mentioned earlier, they are more likely to smoke, overeat, drink too much, work too much, etc.

But also, by mechanisms we don't fully understand, lonely and depressed people are many times, in some studies, three to five times, even ten times more likely to be ill and die prematurely.

And depression is treatable. something needs to be done about it.

On the other hand, anything that promotes intimacy is healing.

It can be sexual intimacy. I happen to think that healing and erotic energies are just different forms of the same thing.

Friendship, altruism, compassion, service—all the eternal truths we spoke of are part of all religions and all cultures, and to our own benefit if we stop trying to see the differences. Because they free us from suffering and disease.

And that is, in some ways, the most selfish thing we can do.

Take a look at a study done by David Spiegel of Stanford University.

He randomly divided women with metastatic breast cancer into two groups.

One group was a support group and met once a week for an hour and a half.

It was a nurturing, loving environment in which they were encouraged to release their emotional defenses and talk to people who understood what they were going through, too, about how terrifying it was to have breast cancer.

They met once a week for a year.

And that was the only difference between the groups.

This was a randomized controlled study published in "The Lancet".

Other studies have shown this as well.

So these simple things that create intimacy are truly healing.

The word “healing” also comes from the etymology of “to prepare the whole”.

The word "yoga" comes from Sanskrit and means "union", "yoke, unite".

The last slide I would like to show you, again, is from this Swami that I have learned over the years.

I did a comprehensive round of oncology and cardiology at the University of Virginia School of Medicine several years ago.

And finally someone said, "Hey Swami, what is the difference between health and sickness?"

So he wrote the word "disease" on a chalkboard and circled the first letter, then wrote the word "health" and circled the first two letters.

To me, this is just shorthand for what we are talking about. So anything that creates a sense of connection, community, and love is truly healing.

thank you.

A talented young herbalist named Xu Xian was in trouble.

It should have been a triumphant moment. He had just opened his own pharmacy.

However, he purchased supplies from his former employer, and the outraged man sold him rotten medicinal herbs.

As Xu Xian pondered what to do with this useless inventory, patients flooded into his shop.

A plague swept through the city, and he had nothing to cure them.

When he started to panic, his wife Bai Su Zhen created a recipe using rotten herbs as medicine.

Her cure instantly cured all plague-afflicted nations.

Xu Xian's former boss had to buy back some of the rotten herbs to cure his own family.

Shortly after, a monk named Fakai approaches Xu Xian and warns him that there is a demon in the house.

According to him, the demon is Bai Suzhen.

Xu Xian laughed.

His kind and witty wife was no devil.

Fahai insisted.

He told Xu Xian to treat his wife to Real Garwine on May 5th, when the demon's power is at its weakest.

He explained that if she wasn't a demon, he wouldn't hurt her.

Xu Xian politely dismissed the monk and had no intention of serving Bai Suzhen wine.

But as the day drew near, he decided to give it a try.

As soon as the wine touched Ms. Bai Su Zhen's lips, she said she didn't feel well and ran to her bedroom.

Xu Xian prepared medicine and went to see what was going on.

But instead of my wife, I found a huge white snake with a bloody, forked tongue in my bed.

He collapsed on impact and died.

Bai Su Zhen opened her eyes and immediately realized what had happened.

The truth is, Hakusujin was an immortal serpent with terrible magical powers.

She used her powers to take human form and improve her and her husband's destinies.

Her magic was unable to revive Xu Xian, but she had another idea to save him. It was an herb that gave longevity and could even bring the dead back to life, guarded by an Antarctic old man on the Forbidden Peak of the Kunlun Mountains.

She rode the clouds to the mountains, then walked through gates and arches to a place marked Beyond Mortal over a silver bridge.

On the other side, two of the old man's disciples guarded the herbs.

Bai Suzhen disguised himself as a monk and told him that he had come to invite the old man to a meeting of the gods.

She plucked a few leaves from the herb and ran while they passed on her message.

Realizing that she had been deceived, the servants pursued her.

Hakusujin spat out a magic ball and threw it at one.

When the other approached her, she placed the herb under her tongue to keep it, but the magic reverted them both to their true forms.

As the crane's long beak wrapped around her, an old man appeared.

He asked why she would risk her life to steal his herbs when she was already immortal.

Bai Su Zhen explained her love for Xu Xian.

She was determined to bring him back to life, even though he didn't want to be with her now that she knew she was a demon.

The two had a karmic connection going back over a thousand years.

When Bai Su Zhen was a small snake, a beggar nearly killed her, but a kind passerby saved her.

The one who saved her was Xu Xian in her previous life.

Touched by her willingness to risk her life for him, the old man allowed her to leave the mountain with the herb of immortality.

Bai Suzhen returned home to revive Xu Xian.

When I opened my eyes, the frozen look of fear gave way to a smile.

Devil or not, he was still happy to see his wife.

Little do they know it, but each of these six creatures is about to experience a very unusual death.

One by one they will fall prey to amazing predatory eccentricities...

carnivorous plant.

Worldwide, there are over 600 plant species, including insects, microbes, and even frogs and mice that supplement our normal diet of sunlight, water, and soil.

Scientists believe that carnivory in plants evolved at least six separate times on Earth, suggesting that this meat-munching adaptation is of great benefit to plants.

Carnivorous plants tend to grow in areas with highly acidic soils that are poor in important nutrients such as nitrogen, phosphorus and potassium.

In such harsh conditions, plants that can lure, trap and digest prey have an advantage over plants that depend on the soil for nutrients.

Take a look at this desolate swamp where pitcher plants reign.

Attracted by the pitcher's bright colors and captivating scent, flies approach and sip on the nectar.

However, this pitcher seed has an ingredient in its nectar called coniine, which is a powerful narcotic to insects.

When Conine takes effect, the fly becomes sluggish, staggers, and falls down the funnel into a pool of liquid at the bottom, where it drowns.

Enzymes and bacteria in the liquid slowly break his body down into fine particles that the pitcher plant can ingest through its leaves.

Occasionally, larger prey will also tumble into the deadly funnels of pitcher plants.

A second victim faces a sticky sundew.

The tiny leaves of sundew contain a viscous secretion called mucilage.

Ants quickly become trapped in this mucus.

As she struggles, enzymes begin to digest her body.

Special tentacles sense her movements and wrap around her, constricting her with a suffocating grip.

When she suffocates (which can happen within an hour), the tentacles spread out again to catch the next victim.

Two people left, four more.

The next target dies underground, in the coils of the corkscrew factory.

It searches for food by penetrating roots through small gaps.

But inside, you'll quickly get lost in an intricate labyrinth.

A winding forest of hairs blocks his escape, leading him to a central chamber where meat-digesting enzymes and deadly low levels of oxygen are present.

In the murky depths of a nearby pond, one tadpole involuntarily swims into the tracks of turmeric, the fastest of the carnivorous plants.

When she steps on the bladder trigger, within milliseconds the trapdoor opens and sucks her in.

Half inside and half outside, she struggles to free herself as the parts of her body in the plant are being digested.

Over the next few hours, her writhing repeatedly sets off traps, each time taking her deeper into the factory where she is digested alive bit by bit.

On the other hand, this beetle is attracted to sweet-smelling nectar.

The scent draws him closer and closer until he finds himself on the leaves of one of the world's most notorious carnivorous plants.

When he lands, the surface of the leaf grows tiny hairs and the jaws of the flytrap click shut around him.

Spikes work together to decide his fate.

When the leaf closes, it acts like an outer stomach that digests the beetle's soft tissues.

When it reopens after a few days, only the dry shell of the exoskeleton remains.

Mayfly is the last remaining creature.

As she approached the butterwort plant, she headed for the flower, which swayed high above the plant's sticky slime mass.

She alights on the petals, drinks the nectar, and flies away unharmed.

These long flower stalks keep certain insects away from carnivore traps. This is how pollinators and food are separated.

Let's turn off the hum of the mayfly and live a long and fruitful life - ah.

I would like to talk about stories.

And I want to tell this story because I think we need to remember that the stories we tell each other are more than just stories and entertainment and stories.

They are also a vehicle for sowing inspiration and ideas throughout our society and across time.

The story I'm about to tell is about how one of the most advanced technological achievements of our time has narrative roots, and how some of the most important transformations to come are likely to occur.

The story begins over 300 years ago. It all started when Galileo Galilei first learned of a recent Dutch invention in which two pieces of molded glass were placed in a long tube, thereby extending human vision farther than ever before.

When Galileo pointed his new telescope toward the heavens, especially the moon, he discovered something incredible.

These are pages from Galileo's book Sidereus Nuncius, published in 1610.

And in it he revealed to the world what he had discovered.

And what he discovered was that the moon wasn't just a celestial body that wandered the night sky, but rather a world with high sunlit mountains and dark mare, Latin for sea.

And when this new world and moon were discovered, people immediately started thinking about how to travel there.

And just as importantly, they began writing a story about how it would happen and what that voyage would be like.

One of the first people to actually do so was a man named Francis Godwin, Bishop of Hereford.

Godwin writes a story about Spanish explorer Domingo González. He was stranded on the island of St. Helena in the middle of the Atlantic, where he developed a machine or invention that enabled him to fly using the power of the local geese to get home, and eventually embarked on a voyage to the moon.

Godwin's book, Man on the Moon, or Discourse of a Voyage to It, was published posthumously and anonymously in 1638, probably because it contained controversial ideas, such as support for the Copernican cosmology, which places the Sun at the center of the solar system, and the pre-Newtonian conception of gravity, which held the idea that objects lose weight as their distance from the Earth increases.

And that's to say nothing of his idea of ​​a goose machine that could go to the moon.

(Laughter) And while this idea of ​​a Goosemachine voyage to the Moon may not seem particularly insightful or technically original to us today, the point is that Godwin said he got to the Moon by human invention, not by dreams or magic as Johannes Kepler wrote.

And the idea was that we could build machines that could travel to the skies and plant seeds in minds across generations.

The idea was then picked up by contemporary John Wilkins, then a young student at Oxford University, who later became one of the founders of the Royal Society.

John Wilkins took the idea of ​​space travel in Godwin's writings seriously and wrote not just another story, but a non-fiction philosophical treatise titled "Discovery of a New World on the Moon, or a Discourse Proving That the Planet May Have Another Habitable World."

By the way, notice the word "habitable".

The idea itself would have been a powerful motivator for those thinking about how to build machines that could get there.

In his book, Wilkins seriously considered many technological methods for spaceflight, and to this day remains the earliest known non-fictional account of how humans would travel to the moon.

Other tales soon followed, most notably The Tale of the Moon by Cyrano de Bergerac.

By the mid-17th century, the idea of ​​creating machines that would allow people to travel to heaven had grown in complexity and technical nuance.

By the late 17th century, however, this intellectual progress had virtually come to a halt.

People still told stories about reaching the moon, but they relied on old ideas, or dreams and magic again.

why?

Newton's discovery of the law of gravity and the invention of the vacuum pump by Robert Hooke and Robert Boyle meant that people understood that a vacuum exists between the planets and between the Earth and the Moon.

And they had no way of overcoming this, no way of thinking about overcoming this.

Thus, for over a century, the idea of ​​a voyage to the Moon brought little intellectual progress until the Industrial Revolution broke out and the development of steam engines, boilers and, most importantly, pressure vessels.

And these gave people the tools to think about how to build a capsule that could withstand the vacuum of space.

Under these circumstances, in 1835 Edgar Allan Poe wrote the next great story of spaceflight.

Well, today we think of Poe in terms of gothic poetry and narrative minds and ravens.

However, he considered himself a technical thinker.

He grew up in Baltimore, the city where gas street lighting was first introduced in the United States, and was fascinated by the technological innovations happening around him.

He considered his own best work not to be a Gothic tale, but the epic prose poem Eureka, which explained his own personal views on the cosmological nature of the universe.

In his stories he describes machines and contraptions in fantastic technical detail, but nowhere is he more influential in this than in his short story "The Unique Adventures of a Hans Pfahl".

This is the story of an unemployed bellows craftsman from Rotterdam. Depressed, fed up with life, and in debt, he decides to build a chariot with an enclosed balloon that is dynamite-launched into the air and from there floats through the vacuum of space to the moon's surface.

And importantly, he didn't develop this story alone. For in an appendix to his story he clearly acknowledges the influence of Godwin's Man on the Moon over 200 years ago, calling it "a peculiar and somewhat original little book."

And while this idea of ​​a balloon voyage to the Moon may not seem as technically sophisticated as the Goose Machine, in fact Poe described it in sufficient detail in terms of the description of the device's construction and the trajectory dynamics of the voyage that it could be schematized in the first spaceflight encyclopedias as a 1920s mission.

And it is this attention to detail, or, as he puts it, to "truth," that will influence the next great story, Jules Verne's From the Earth to the Moon, written in 1865.

And it's a story of remarkable legacy and striking similarities to the actual voyage to the Moon over 100 years later.

Because, in the story, the first voyage to the moon takes place from Florida with three people on board, taking three days. This is exactly the same condition that prevailed during the Apollo program itself.

And in a clear tribute to Poe's influence on him, Verne notes in his book that the group responsible for the feat was the Baltimore Gun Club in Baltimore, whose members shouted "Cheers to Edgar Poe!"

They began planning to conquer the moon.

And just as Verne was inspired by Poe, Verne's own story will influence and inspire the first generation of rocket scientists.

Konstantin Tsiolkovsky and Hermann Oberth, the great pioneers of liquid-propellant rockets in Russia and Germany, both traced their beginnings in the field of spaceflight to reading "From the Earth to the Moon" as teenagers and then decided to make that story a reality.

And Verne's story wasn't the only tale that had a lasting impact in the 19th century.

On the other side of the Atlantic, H.G. Wells' War of the Worlds had a direct impact on young Massachusetts youth Robert Goddard.

And it wasn't until after reading War of the Worlds that Goddard wrote in his diary one day in the late 1890s that he had taken a break from pruning cherry trees on his family's farm and had a vision of a spaceship rising out of the valley below and into the heavens.

And he decided right there and then that he would devote the rest of his life to developing the spacecraft that he saw in his mind's eye.

And he did just that.

Throughout his life, he celebrated that day as his anniversary, Cherry Blossom Day, and regularly revisited the works of Verne and Wells for inspiration and renewal of the decades of work and effort required to realize the first part of his dream, the flight of liquid-propellant rockets, which he finally achieved in 1926.

It was, therefore, reading "From the Earth to the Moon" and "The War of the Worlds" that the first pioneers of astronautics were inspired to dedicate their lives to solving spaceflight problems.

And it was their papers and writings that inspired the first technical communities and the first projects of spaceflight, creating a direct chain of influence from Godwin to Poe to Verne to the Apollo program and the spaceflight community today.

So why did I tell you all this?

Is it just because you think it's cool, or is it because you're strangely drawn to 17th- to 19th-century sci-fi stories?

Yes, in part it is.

But I also think these stories remind us of the cultural processes that drive spaceflight and broader technological innovation.

As an economist working at NASA, I spend my time thinking about the economic origins of our movement into space.

And before the investments of billionaire high-tech entrepreneurs, before the Cold War space race, and even before military investment in liquid-propellant rockets, the economic origins of spaceflight are found in stories and ideas.

In these stories, the first concepts of spaceflight were articulated.

And through these stories, tales of humanity's future in space began to travel head-to-head, eventually forming an inter-generational intellectual community that iterated on spacecraft ideas until they were finally able to be built.

This process has been going on for over 300 years and the result is the culture of spaceflight.

It is a culture that has involved thousands of people over hundreds of years.

For hundreds of years some of us have been stargazing and wishing to go.

And some of us have spent hundreds of years devoting our efforts to developing the concepts and systems necessary to make that voyage possible.

I also wanted to tell you about Godwin, Poe and Byrne. Because I think their stories also teach us the importance of the stories we tell each other about the more general future.

Because these stories don't just convey information and ideas.

You can also develop passions and passions that lead you to dedicate your life to the realization of important projects.

What this means is that these stories can and do have social and technological impact for centuries.

I think we need to be aware of this and remember it when we tell our stories.

We have to work hard to write stories that don't just show us the dystopian paths we might take, for fear that the more dystopian stories we tell each other, the more we'll be planting seeds for possible dystopian futures.

Instead, we need to tell stories that plant the seeds of great new projects of technological, social and institutional change, if not necessarily utopias, then at least.

And if we think this idea that the stories we tell each other can change the future is fantastic or impossible, I think we need to remember this example, our trip to the moon. This is a 17th-century idea that propagated culturally for over 300 years before its final realization.

Therefore, we have to write a new story. We need to write stories that people 300 years from now can look back and tell how they inspired us to new heights and new shores, how they showed us new paths and new possibilities, and how they shaped our world for the better.

thank you.

(applause)

I hear that we are in the age of the environment, or biology, or information technology...

Well, now is the time for many things to happen. But one thing is certain: these are times of change. The history of mankind on Earth is undergoing greater changes than ever before.

You know it to some extent, but it's hard to understand until you really understand it.

And I've put together a good start for that.

There's no color in this, but I tried to show that what I'm interested in is the little 50-year time bubble you're in. People tend to be interested in a generation's past, a generation's future: parents, children, what can change in the next few decades, and this 50-year time bubble. And if you look at the population curve over that 50-year period, you'll see that the human population on Earth has more than doubled, and we've tripled. A year and a half after I was born. When a new baby is born, by the time that child graduates from high school, there will be more people on the planet than there were when I was born.

This is unprecedented and a big deal.

The future direction is questioned. That's the human part.

Now for the part of humans related to animals. Look to the left of it.

What I call the human part is humans and their livestock and pets. The natural part, on the other hand, is all other wild animals, and these are all animals, such as vertebrates and birds, that live on land and in the air, but not in water. How's the balance going?

Indeed, 10,000 years ago, when civilization began, the human population was less than 1/10 percent. Let's see.

If you follow this curve, you will see a white dot in the middle. This is the 50 year time bubble. Humans, livestock, and pets now make up 97 percent of the total mass on Earth, while wild nature makes up 3 percent. we won. The next generation doesn't even have to worry about this game. It's over.

And the biggest problems have occurred in the last 25 years. increased from 25 percent to 97 percent.

And this is a very sobering feeling when we realize that we humans are responsible for life on Earth. We are like the whimsical gods of old Greek mythology, playing with life, but without much wisdom infused into it.

Well, the third curve is information technology.

This is Moore's Law plotted here, which is related to information density, but is very good at showing many other things about information technology, such as computers, their usage, the Internet. And the important thing is that it just goes straight through the vertices of the curve and has no real limit. Now let's compare them.

This is the size of the Earth passing through the same frame (laughter). I have combined all four into one chart for clarity.

You don't have to look at the fine print.

The first is man versus nature. We won, so no more profit. human population.

So if you're looking for a growth industry to enter, protecting wildlife is not a good industry. Human population is increasing. It will last for quite some time.

Jobs such as obstetricians, undertakers, agriculture, and housing are doing well. These all deal with the human body and require food, transportation, containment, etc. And the information technology that connects to our brain knows no bounds. This is a great field. Are you looking for growth opportunities?

It just goes up through the roof.

And then the size of the earth. Somehow putting all this together seems like a pretty bad industry to get involved in.

So that's all this stage. I don't know why, but it turns out that I really have a goal.

And the goal is that when my children reach my age, that is, when it comes to the next generation, the world will be a desirable and sustainable one. I think that's probably a goal we all share.

I think it's a hopeless goal. Technically it is feasible. economically achievable. Politically it means something like the habits and institutions of the people, which is impossible.

All institutions of inertia in the past are utterly irrelevant to the future, except that they are there and we have to deal with them. I devote about 15 percent of my time to saving the world, and the other 85 percent to normal and other things.

And 15 percent of them focus primarily on the human mind and thinking skills, trying to somehow break free from the shackles of a school stuffed with information and dogma, to get them to really think, ask tough questions, debate serious subjects, disbelieve everything in a book, and think broadly and creatively. Maybe so.

Our school system is so flawed and unrewarding for what is important to life and the survival of civilization. It rewards you to learn a lot and understand the content.

Due to lack of time, I cannot discuss this today. This is a broad subject. One thing is for sure, the future will bring essential capabilities that help you do more with less. Necessary but not sufficient. We need to do things more efficiently, using less energy and less materials.

Your great-grandparents lived on muscle strength, and we all think we have this enormous power that is integral to our lifestyles. And with the amazing technology we have, we can do more efficient things like saving and recycling.

I would like to quickly explain my work so far.

Human-Powered Airplanes -- In 1976 and 1977 Gossamer Condor was the catalyst that steered me in this direction, winning the Kraemer Prize in Aviation History, followed by the Albatross. And then we started making all sorts of weird planes and creatures.

This is a giant flying replica of a tailless pterosaur.

Trying to fly straight is like trying to shoot an arrow with the winged tip in front of you. It was hard work, but it gave me a great respect for nature.

This was the full size of the original creature.

We did a lot of things on land, in the air, and on the water. Various types of vehicles, usually equipped with electronics and power systems. I think it's the same on land, in the air, and in the water.

Here we focus on air. This is an airplane powered by solar power. People travel 165 miles from France to England to symbolize how solar power will be an important part of our future. He then developed the Sunracer, a solar car for General Motors, which won a race in Australia.

Many people have thought about electric cars and what they can do. Years later, when we suggested to the GM that now was the time and we could do something called Impact, they sponsored it. And here is Impact, which we developed with them in their program. This is a demonstrator. And we put a lot of effort into commercializing it.

With that out of the way, let's take a look at the first two minutes of the videotape. It shows how a small surveillance plane moves to a huge plane.

Narrator: A small plane, an AV pointer can help monitor. It's actually a moving pair of glasses. A state-of-the-art example of how miniaturization is possible when the operator is at a distance from the vehicle. Convenient to carry, assemble and start by hand. It's battery-powered, so it's quiet and almost unnoticeable.

Send high resolution video images back to the operator.

It has GPS so it can fly autonomously and is robust enough to auto-land without damage.

Modern sailplanes are very efficient.

Some can glide 60 feet flat ahead for every foot of descent.

They are powered only by the energy that can be extracted from the atmosphere, the atmosphere that nature churns with solar energy.

Humans and flying birds have found nature to be a generous source of replenishable energy. The sailplane has flown over 1,000 miles and has an altitude record of over 50,000 feet.

(music) The Solar Challenger was created to symbolize that solar cells can generate real power and be part of the world's energy future.

In 1981, he laid the groundwork for the Pathfinder by flying 263 miles from Paris to England, relying solely on the sun's rays.

(music) The message from all these rides is that ideas and technology can be harnessed to create noticeable benefits by doing more with less effort. Its benefits help achieve the desired balance between technology and nature. As we speed into a difficult future, the risks are high.

Buckminster Fuller put it plainly, "There are no passengers on Spaceship Earth, only crew members. We crew members can and should do more with less effort."

Paul McCready: If you could put in a second video (1 minute) ASAP, this would show a Pathfinder plane flying over Hawaii over the past year, and some of the beauty behind it just after it flew to an altitude of 71,530 feet, higher than any propeller plane I've ever flown.

It's amazing. With just a little bit of the sun's power, you can get there with an ultra-light plane.

This is part of a long-term program sponsored by NASA.

And we worked so closely together that everything was a team effort, and we had such a great result that flight.

And we are working on a larger plane (220 feet span) and a mid-size plane with regenerative fuel cells that can store excess energy during the day, feed back energy at night, and maintain altitudes of 65,000 feet for months at a time.

(music) Ray Morgan's voice comes in here.

There he is the project manager. Everything they do is definitely a team effort. he ran this program. This is...

What he showed me at the end as a celebration.

Ray Morgan: We've just completed a seven-month deployment to Hawaii.

For those living on the mainland, leaving home was hard.

The friendly support, quiet confidence, and thoughtful hospitality shown by our Hawaiian and military hosts - (music starts) - made the experience enjoyable and unforgettable.

PM: Real-time IR scanning is done over the internet while the plane is in flight. And we are exploring without polluting the stratosphere. That's the goal. The stratosphere, the blanket that actually controls Earth's radiation and allows life on Earth to thrive. Investigating it is very important. And because it can stay overhead for months at a time, nearly 2,000 times better than a real GFC synchronous satellite, we think of it as a poor man's geostationary satellite of sorts.

I couldn't bring it here and fly it to show you.

But now let's look at the other end.

In the video, we saw Keenan-developed 9- or 8-pound Pointer airplane surveillance drones do a remarkable job. Some servos are as light as 18 or 25 grams, but this one weighs a third of a gram. And what he's about to bring here is a surveillance drone that weighs about 2 ounces. This includes the video camera, the battery that powers it, the telemetry device, the receiver, etc. And I hope I can fly with the same success as when I practiced last night.

So Matt Keenan, anytime is fine, ready to let her go. But first, make sure it's on screen to see what you're seeing.

You can imagine yourself as a mouse or fly inside a mouse and look out of camera.

Matt Keenan: The switch is on.

PM: But now we're trying to get the video. Let's go.

MK: Could you turn on the lights in the house?

PM: Yes, my house will be brighter, I will be able to see you all, and I will be able to fly planes better.

MK: Okay, I'll try to put it back in a few laps.

please.

(Applause) Prime Minister: The video worked the first few times, but I don't know why. That's all.

Oh, it was only a minute, but I think it's probably safe to hear it near the end of the flight.

We end up doing the classic.

have understood.

Even if it hits you, you won't get hurt.

(laughter) Okay.

(Thank you for applause. thank you.

(Applause.) But now, as the infomercial says, we have better things in store for you, and they're in development. It's a plane that's only six inches, or fifteen centimeters, in size.

And Matt's plane graced the cover of Popular Science magazine last month to show what this can bring. And sooner or later, something of this size will have GPS and a video camera. We flew one of these 9 miles in the air at 35 miles per hour with just a few batteries.

But many technologies are advancing.

There are some milestones along the way of some notable things.

This doesn't include a video, but it gives you a little idea of ​​what it can do.

yes, I'll go.

(laughs) MK: I'm sorry.

OK。

(Applause) Afternoon: Please let me know when you're done. Well, I think I've lost my way a little bit. I looked up at this light.

It hit a building. And, in fact, the location of the building was bad.

(Laughter.) But we're starting to see what we can do.

We are currently working with Caltech and UCLA under a contract with DARPA to develop wings the size of a hawk moth.

I have no idea where this all leads. Is it practical? don't know.

But like any basic research, if you need to do work well beyond existing technologies, you can use microtechnology, nanotechnology to get there.

When you understand what nature has been doing all along, you can do amazing things. When we reach such a small scale, we realize that we have a lot to learn from nature and not the 747. But when we descend into the realm of nature, nature has 200 million years of experience.

It never makes mistakes. Because if you make a mistake, you can't leave your offspring.

We should have nothing but successes from nature, for humans and for birds, and we are learning a lot from that fascinating subject.

Finally, I would like to return to the big picture. Finally, I'll use two slides to organize the big picture.

Just read first. I put three sentences at the end and asked them to say what they wanted to say.

For billions of years in its own realm, chance has painted the thin shroud of life as complex, improbable, wonderful and fragile. Suddenly, we humans, a recently emerging species, no longer subject to the natural checks and balances of nature, have grown to a position of frighteningly powerful population, technology, and intelligence. I will use a paintbrush this time.

And seriously, we are not very smart. We lack wisdom. We are tech savvy. where does it lead?

Well, that sentence inspired me to pick up a paintbrush.

I paint every 25 years. This is one of them. It's trying to show that the world isn't getting any bigger.

We saw some sort of timeline, very non-linear scales, natural speeds, trilobites, dinosaurs, and eventually humans with caves... Pterosaurs followed by birds flying overhead.

And then we reach civilization on small TVs with guns. Then traffic jams, power systems, and some digital stuff. Where it goes - I have no idea.

So I just put robots and natural cockroaches in there, but you can bury whatever you want. This is not a prediction.

This is a warning and we should take it seriously.

And it's not 100 or 500 years when this happens.

This situation will continue for the next ten years. We have a very short time to decide what to do.

And I think if we can get some agreement on what we want the world to be, which is to be a desirable, sustainable world when your children are your age, then we can actually achieve that. Well, I said this was a warning, not a forecast. That was a while ago -- I drew this before I started making robot versions of the hawk moth and cockroach, but now I'm seriously starting to wonder -- was this more of a prediction than I had hoped for?

I personally believe that the surviving intelligent life on Earth is not carbon based. It will be silicon based.

So I don't know where it all goes.

The final sparkle to add here is the totally impractical flying object. This is a small flapping device powered by a rubber band. I'll show you.

MK: 32 grams. Sorry, 1 gram.

PM: Last night I rotated it too much and almost knocked the roof off. It's about 1 gram.

The tube there is hollow and as thin as paper.

And if this ever happens to you, I assure you it will do you no harm.

But if you try to grab it or try to grab it, you destroy it.

So be gentle and act like a wooden Indian or something.

And when it settles, let's see how it goes.

We think this is kind of the spirit of TED.

(Applause.) And you wonder if it's practical? And if I hadn't, it turns out -- (Laughter) (Applause) Unfortunately, some of the bulbs have been replaced.

It can probably be submerged, but maybe it's doomed to a greater extent than ever -- (laughter) --. And all I wanted to say was -- (applause) just -- (applause) but I just want to say two things. For one thing, I think it's frivolous. it's nothing. Yet, in 1939, to put it a little more broadly, if I hadn't built such an ornithopter, long ago, there wouldn't have been a Gossamer Condor, an Albatross, a Solar Challenger, an Impact Car, or a zero-emissions car mandate in California.

Many of these things, or something similar, would have happened sometime in the decade, perhaps. At the time, I didn't realize that the team was doing research-based, hands-on things like they were trying to enter the education system.

So I think it's important as a symbol.

And I think that's important too. You can think of it as a kind of symbol for learning and TED. It makes you think about technology and nature, and brings them all together into something real. I think that's what makes this conference more important than any conference that's been held in this country in the last decade.

thank you. (applause)

FIRST KISS Her mouth was like summer snow, like the fifth season, like a fresh Eden, like Eden when Eve whined to God with the liquid tilt of her hips, her kiss was so painful—I swear it was as if she mixed the sweat of an angel with the taste of a tangerine. My mouth was forever a helmet full of secrets, my mouth was a little lit cul-de-sac with teeth--My heart was a clam shut in the dark, but her mouth lifted up like a canary-laden blue Cadillac driven by a toucan--I swear her lips gave out glowing wings when I kissed--Wild and precise--As if I was teaching a seahorse how to speak--Her mouth was so discreet. Slammed the first vowels out of my throat until my brain became a piano Slammed so hard, hammered so hard--It was like her tongue was Saturn's seventh moon--So hot, hot and cold, twirling and turning me into a delightful planet--Sun on one side, night on the other, pouring out her slow hands. One fire makes the other kite fly.

Her kiss, I swear - if the Great Mother hastily opened the moon like a gift, and you were there to feel your shadow finally lifted from your wrist.

That's fine, but sweeter--like a riot of pogostick-footed priests, up, up, there, this way, never falling, ill-mannered but holy--I swear! That kiss, both lips like a peace corps, like a free shop, forever and always a new city, no locks, no walls, just a door, so I swear.

Well, I'm glad you're here.

We have heard a lot about the possibilities of technology and its dangers.

I was quite interested in both.

If we could convert 0.03 percent of the sunlight that hits our planet into energy, we could meet all projected demand in 2030.

You can't do that today because solar panels are heavy, expensive, and very inefficient.

At least in theory there are nanoengineered designs that have been analyzed and shown to be very lightweight, very cheap, very efficient, and indeed we could meet all of our energy needs in this renewable way.

Nano-engineered fuel cells have the potential to deliver energy wherever it is needed.

That is the key trend, decentralization, moving from centralized nuclear power plants and liquid natural gas tankers to cleaner, far more efficient, more capable, mess-free distributed resources.

Bono said so eloquently that for the first time we had the tools to deal with the age-old problems of disease and poverty.

Most parts of the world are moving in that direction.

In 1990, 500 million people in East Asia and the Pacific were living in poverty; today that number is below 200 million.

The World Bank projects that number will fall below 20 million by 2011, a 95% reduction.

I really enjoyed Bono's commentary connecting Haight Ashbury and Silicon Valley.

I'm from a high-tech community in Massachusetts myself, so I used to hang around Harvard Square, and I want to point out that we were hippies in the 1960s, too.

But we have the potential to overcome disease and poverty, and if we are willing, we will talk about them.

Kevin Kelly talked about accelerating technology.

It's a subject of great interest to me and one I've been developing for almost 30 years.

When I finished the project, I realized that my technology had to make sense.

Whenever I introduced technology, the world was a different place.

And I realized that most inventions fail not because the R&D department can't do them. If you look at most business plans, they actually succeed when given the chance to build what they say they will build. And over 90 percent of those projects fail because the timing is wrong. Not all enablers are there when you need them.

So I began to study technology trends diligently, tracking the state of technology at different points in time, and building mathematical models of it.

It's kind of like living your own life.

I have a group of 10 people collecting data and building models on key measures of technology in different areas.

And you will hear voices saying that the future cannot be predicted.

And if you ask me if Google's price will be higher or lower than it is now in three years, it's very difficult to say.

Will WiMax CDMA G3 be the wireless standard in three years? It's hard to say.

But when you ask how much it will cost to compute 1 MIPS in 2010, how much it will cost to sequence a DNA base pair in 2012, or how much it will cost to transmit a megabyte of data over the air in 2014, they turn out to be very predictable.

There is a surprisingly smooth exponential curve that governs price performance, capacity and bandwidth.

I'm going to show you a small sample of it, but there are actually theoretical reasons why technology develops exponentially.

And most people think linearly when they think about the future.

They think that at today's pace of progress, they will continue to develop or address problems using today's tools, and they do not consider this exponential growth.

The Genome Project was a controversial project in 1990.

We got the best Ph.D. Students, using state-of-the-art equipment around the world, we have completed 1 in 10,000 projects. So how do we get this done in 15 years?

And 10 years after the project's inception, skepticism still persists.

However, due to the nature of exponential growth, it explodes when it hits a bend in the curve.

Most of the project was completed during the last few years of the project.

It took 15 years to sequence HIV, but 31 days to sequence SARS.

So we have the potential to overcome these problems.

Here are some examples to show how prevalent this phenomenon is.

Our model shows that the actual rate of paradigm shift, or adoption of new ideas, doubles every decade.

These are all logarithmic graphs, so they typically scale by a factor of 10 or 100 as the levels increase.

It took half a century to adopt the first virtual reality technology, the telephone.

Cell phones became popular about eight years later.

If we apply the various communication technologies to this logarithmic graph, we can see that television, radio, and telephone have been adopted over the decades.

Modern technologies such as PCs, web and mobile phones are less than a decade old.

Now, this is an interesting graph, and it really captures the underlying reason why evolutionary processes, and biology and technology, both being evolutionary processes, are accelerating.

They work through dialogue. In other words, create a feature and use that feature to move to the next stage.

So the first step in biological evolution, the evolution of DNA (actually RNA was first), took billions of years, but then evolution used its information processing backbone to bring about the next stage.

So the Cambrian Explosion, during which all animal body designs evolved, took only 10 million years. It was 200 times faster.

Evolution then used that body design to evolve higher-order cognitive functions, and biological evolution continued to accelerate.

It is an inherent property of the evolutionary process.

So Homo sapiens, the species that gave birth to the first technology, is a species that combines cognition with opposing appendages, and chimpanzees, by the way, don't have very good opposing thumbs, so they can actually manipulate the environment with power grips and fine motor coordination, and use mental models to actually change the world and bring technology to life.

But in any case, the evolution of our species took hundreds of thousands of years, and then through interaction, evolution essentially took advantage of the technology-producing species to move to the next stage, which was the first step in technological evolution.

And the first step took tens of thousands of years - stone tools, fire, wheels - kept accelerating.

We have always used the latest generation technology at the time to create the next generation.

It took a century before the printing press was adopted. The first computers were designed with pen on paper. We are using computers now.

And we have continuously accelerated this process.

By the way, when you look at this on a linear graph, it all seems to have happened, but one observer says, "Well, Kurzweil just put the points on this graph that lie on this straight line."

So I pulled 15 different lists from leading thinkers, including the Encyclopædia Britannica, the Museum of Natural History, and Carl Sagan's cosmology. These people weren't trying to get my point across. I think they thought that these were just a list of references and that the important events were in biological and technological evolution.

And form the same straight line again. The line is a little thicker because there is disagreement about what was important, when agriculture started, how long it took for the Cambrian Explosion, etc.

But there are very clear trends.

There is a fundamental and significant acceleration in this evolutionary process.

Information technology is doubling in capacity, price-performance and bandwidth every year.

And it's a very serious explosion of exponential growth.

Personal experience when I was at MIT. The computer takes up the size of this room and is less powerful than the computer on your cell phone.

But Moore's Law, which is so often associated with this exponential growth, is just one example of many, as it is fundamentally a property of the evolutionary process of technology.

I've put 49 famous computers on this logarithmic graph -- by the way, the straight line on the logarithmic graph is exponential -- it's also exponential.

It took three years to double the price-performance of computing in 1900, with two years on the way. Now we double that every year.

And it's exponential growth with five different paradigms.

Moore's Law was only the last part of it, shrinking transistors on integrated circuits, but there were electromechanical calculators, relay-based computers that cracked the German Enigma code, vacuum tubes that predicted Eisenhower's election in the 1950s, the unobtrusive transistors used in the first space flights, and Moore's Law.

Every time one paradigm lost momentum, another emerged from the left field and continued to grow exponentially.

Vacuum tubes shrunk and got smaller and smaller.

It hit a wall. It was not possible to shrink them and maintain a vacuum.

An entirely different paradigm -- the transistor was born out of woodwork.

In fact, when the limits of a particular paradigm become apparent, research pressure is created to create the next paradigm.

And we've been predicting the end of Moore's Law for quite some time, so the first prediction said 2002, now it's 2022.

But by the teenage years, transistor features are a few atoms wide and cannot be shrunk any further.

This is the end of Moore's Law, but it's not the end of the exponential growth of computing as chips are flat.

We live in a three dimensional world. You can also use 3D.

We are entering the 3rd dimension, and in the last few years we have made great strides in working with 3D self-assembled molecular circuits.

We will be well prepared for Moore's Law before it loses momentum.

So are supercomputers.

Intel Chip Processor Performance, Average Transistor Price -- In 1968, $1 could buy you a transistor.

$10 million available in 2002.

It's quite remarkable how smooth the exponential process is.

So while you might think this is the result of a paper experiment, this is the result of chaotic global action - countries blaming each other for product dumping, IPOs, bankruptcies and marketing programs.

You might think it is a very volatile process, but you get very smooth results from this chaotic process.

Just as you can't predict what a single molecule in a gas will do, predicting a single molecule is hopeless, but thermodynamics can predict the properties of entire gases with great accuracy.

Same thing here. While we cannot predict any particular project, the outcome of this entire world-wide process of chaotic and unpredictable competitive activity and technological evolution is highly predictable.

And we can predict these trends far into the future.

Unlike Gertrude Stein's rose, a transistor is not a transistor.

Making electrons smaller and cheaper reduces the distance they can travel.

Transistor speeds are increasing exponentially, and the cost of a single transistor cycle is declining at a 1.1-year halving rate.

Adding other forms of innovation and processor design doubles the price-performance of computing every year.

And it's basically deflation -- 50 percent deflation.

It's not just computers. So this also applies to DNA sequencing. That goes for brain scans, too. The same applies to the World Wide Web. So, anything that can be quantified, there are hundreds of different information-related metrics like capacity and adoption rates that basically double every 12, 13, 15 months, depending on what you're looking at.

From a price performance perspective, the deflation rate will be 40-50%.

And economists are really starting to worry about it.

We had deflation during the Great Depression, but it was a collapse of the money supply, a collapse of consumer confidence, a completely different phenomenon.

This is due to productivity gains, but economists say, "But it's impossible to keep up.

With 50 percent deflation, people might increase output by 30 or 40 percent, but they can't keep up. ”

But what we're really seeing is more than we can really keep up with.

Over the past 50 years, the value of information technology has grown at a compound annual rate of 28%.

So 10 years ago no one was building an iPod for $10,000.

New applications enter the market as price performance makes new applications feasible.

And this is a very widespread phenomenon.

Magnetic Data Storage -- It's not Moore's Law. Magnetic spots, different engineers, different companies, same exponential process are shrinking.

A key revolution is that we are now able to understand our own biology in terms of these information terms.

We understand the software programs that run our bodies.

They evolved in completely different times. We really want to change these programs.

A small software program called the Fat Insulin Receptor Gene basically tells you, "Because next hunting season may not go well, cut back on all your calories."

It was for the benefit of the species tens of thousands of years ago.

I would actually like to turn that program off.

They tested it on animals, and these mice ate voraciously, stayed lean, and gained the health benefits of being slim.

They didn't get diabetes. They didn't get heart disease. They lived 20 percent longer. They got the health benefits of calorie restriction without having to restrict calories.

Four or five pharmaceutical companies noticed this and thought it would be an interesting drug for the human market. It's just one of 30,000 genes that influence our biochemistry.

I, like myself, have evolved into a time when living a long life is not in the interest of most people at this conference. Because we were using up precious resources that could be better allocated to our children and those who care for them.

So, while we weren't chosen for a long lifespan, well over 30 years, we are learning how to actually manipulate and modify these software programs through the biotechnology revolution.

For example, RNA interference can now be used to disrupt genes.

There is an exciting new form of gene therapy that overcomes the problem of placing genetic material in the correct location on the chromosome.

In fact, for the first time, research into actually treating the fatal disease pulmonary hypertension using gene therapy is now being done in humans.

So there will be designer babies as well as designer baby boomers.

And this technology is also accelerating.

In 1990 it was $10 per base pair, in 2000 it was a penny.

It's now less than a tenth of a cent.

The amount of genetic data -- basically, this represents a smooth exponential growth doubling every year that allowed the genome project to be completed.

Another big revolution is the communications revolution.

Price performance, bandwidth, and capacity were measured in various ways. Wired and wireless are growing exponentially.

The power of the Internet has multiplied in many ways and will continue to do so.

This is based on the number of hosts.

Miniaturization -- The size of technology, both wired and wireless, is shrinking at an exponential rate.

These are some of the designs published in Eric Drexler's book. What we are now showing is feasible in supercomputing simulations, and there are scientists actually building molecular-scale robots.

Some actually walk in a surprisingly human-like gait made of molecules.

A small machine is doing something at the experimental base.

The most exciting opportunity is to actually enter the human body and perform therapeutic and diagnostic functions.

And this is not as futuristic as one might think.

These things are already done in animals.

There is one nano-engineered device to treat type 1 diabetes. It's about the size of a blood cell.

They put tens of thousands of this in blood cells and tested it in rats. It releases insulin in a controlled manner and actually cures type 1 diabetes.

What you are looking at is the design of a robotic red blood cell, which raises the question that our biology is actually very suboptimal, even if remarkable in its complexity.

Once we understand how it works, and the pace of reverse engineering in biology accelerates, we can actually design these things to be thousands of times more powerful.

Designed by Rob Freitas, this respiratory cell analysis showed that replacing 10 percent of red blood cells with these robotic versions could run an Olympic sprint for 15 minutes without breathing.

You could sit at the bottom of the pool for four hours. So the phrase "Honey, I'm in the pool" will take on a whole new meaning.

It will be interesting to see what we do with the Olympic trials.

Perhaps we will ban them, but then high school gyms will routinely have teenagers outperforming Olympians.

Freitas has a robotic white blood cell design.

These are scenarios circa 2020, but not as futuristic as you might think.

There are four major conferences on building blood cell-sized devices. There are many animal experiments.

There are some that are actually being tested on humans, and it is a feasible technology.

Going back to the exponential growth of computing, $1,000 computing is now somewhere between an insect brain and a mouse brain.

In the 2020s, it will cross over with human intelligence in terms of capabilities, but that's the hardware side of the equation.

Where can I get the software?

It turns out that you can see inside the human brain. In fact, not surprisingly, the spatial and temporal resolution of brain scans is doubling every year.

And with a new generation of scanning tools, for the first time we can actually see individual interneuronal fibers and see their processing and signaling in real time. But the question is, now that we have this data, can we make sense of it?

Doug Hofstadter believes that perhaps our intelligence is not big enough to comprehend our own. If we were smarter, our brains would be even more complex and we would never keep up.

It turned out to be understandable.

This is a block diagram of a model and simulation of the human auditory cortex, which works very well in practice and gives results very similar to human auditory perception when psychoacoustic tests are applied.

There is another simulation of the cerebellum (more than half of the neurons in the brain) that also works very similarly to human skill development.

This is still early days, but by the 2020s we will have successfully reverse-engineered the human brain, as evidenced by the exponential growth in information about the brain and the exponential improvement in brain scan resolution.

We already have very good models and simulations for about 15 of the hundreds of regions.

All of this drives exponentially growing economic development.

Over the past 50 years, productivity has risen from $30 to $150 per hour worked.

E-commerce is growing exponentially. It's now $1 trillion.

You may wonder if there were booms and recessions.

It was strictly a capital market phenomenon.

Wall Street realized this was a revolutionary technology, and it was, but half a year later, when it wasn't revolutionizing all business models, they thought, well, it was wrong, and they had this bankruptcy.

got it. This is a technology put together using some of the technologies we are involved with.

This will become an everyday feature of mobile phones.

You can translate from one language to another.

So I'd like to finish by presenting some scenarios.

Computers will be dead by 2010.

They are so small that they will be embedded in our clothing and environment.

Images are written directly to the retina, providing a fully immersive virtual reality, augmented reality. We interact with virtual personalities.

But if we get to 2029, these trends will have fully matured, and at that point technology generations will go faster and faster, and we need to understand how much they can turn the screws.

So the price-performance, capacity, and bandwidth of these technologies multiply by 2^25, which is pretty staggering.

It will be millions of times more powerful than it is today.

We would have completed reverse engineering the human brain. $1,000 of computing is far more powerful than the human brain in terms of basic raw capacity.

Computers combine the subtle pancognitive abilities of human intelligence with the way machines already excel at carrying out analytical thinking and accurately remembering billions of facts.

Machines can share knowledge very quickly.

But it's not just an invasion of intelligent machines by aliens.

We are going to merge with technology.

These nanobots I mentioned will first be used for medical and health applications. That means cleaning the environment, providing powerful fuel cells and distributed solar panels widely dispersed in the environment.

But they will also enter our brains and interact with biological neurons.

We have demonstrated a key principle to make this happen.

For example, in fully immersive virtual reality from within the nervous system, nanobots block signals coming from the human sense of reality and replace them with signals that the brain would receive if it were in a virtual environment. Then you will feel as if you are in that virtual environment.

You can go there with other people and have all kinds of experiences with anyone using all your senses.

Those who I call them “Experience Beamers” publish on the internet the entire stream of sensory experiences in neurological correlation of emotions.

Plug in and experience what it feels like to be a different person.

But most importantly, human intelligence will be greatly augmented through direct integration with our technology. In a way we are already doing that.

We routinely perform intellectual feats that would be impossible without technology.

Human life expectancy is increasing. In 1800 it was 37, but with this kind of biotechnological, nanotechnological revolution, that number will rise very quickly in the next few years.

My main message is that technology progress is exponential, not linear.

Even scientists, many assuming a linear model, will say that self-replicating nanotechnology assemblies and artificial intelligence will be hundreds of years away.

Seeing the power of exponential growth in action shows how quickly these things can happen.

And information technology increasingly envelops everything in our lives, from music to manufacturing to biology to energy to materials.

In the 2020s, nanotechnology will allow us to manufacture almost anything we need from information using very cheap raw materials.

These are very powerful technologies.

They both reinforce our promises and dangers.

We must therefore be willing to apply them to the appropriate problems.

thank you very much.

(applause)

you are lifting weights

It feels easy at first, but each lift requires more and more effort, and eventually it becomes unsustainable.

On the inside of the arm, the lifting muscles can no longer contract.

Why Do Our Muscles Fatigue?

We often blame lactic acid and lack of energy, but these factors alone do not contribute to muscle fatigue.

There is another major factor. It's the muscle's ability to respond to signals from the brain.

To understand what causes muscle fatigue, it helps to know how muscles contract in response to signals from nerves.

These signals travel instantaneously from the brain to the muscles via long, thin cells called motor neurons.

Motor neurons and muscle cells are separated by a small gap, and exchange of particles across this gap enables contraction.

Motor neurons on one side of the gap contain a neurotransmitter called acetylcholine.

On the other side, charged particles or ions coat the muscle cell membrane. Potassium inside and sodium outside.

In response to signals from the brain, motor neurons release acetylcholine, which triggers the opening of pores in muscle cell membranes.

Sodium flows in and potassium flows out.

The flow of these charged particles is a critical step for muscle contraction. The change in charge generates an electrical signal, called an action potential, that spreads within the muscle cell and stimulates the release of calcium stored inside.

This calcium flood causes the proteins buried in the muscle fibers to lock together, allowing them to come closer together causing the muscles to contract and pull them tighter.

The energy used to drive contraction comes from a molecule called ATP.

ATP also helps to subsequently pump ions back across the membrane, resetting the sodium and potassium balance on both sides.

This entire process is repeated each time the muscle contracts.

With each contraction, energy in the form of ATP is used up, waste products such as lactic acid are produced, and some ions drift away from the muscle cell membrane, leaving smaller and smaller groups behind.

Muscle cells consume ATP when they contract repeatedly, but they are constantly producing more ATP, so even heavily fatigued muscles most of the time do not use up this energy source.

Also, although many waste products are acidic, tired muscles still maintain pH within the normal range, indicating that the tissues are effectively removing these waste products.

Eventually, however, during repeated contractions, sufficient concentrations of potassium, sodium, or calcium ions to properly reset the system may quickly become unavailable near the muscle cell membrane.

So even if the brain sends a signal, the muscle cells cannot generate the action potentials needed for contraction.

Even when ions such as sodium, potassium, and calcium are depleted in or around muscle cells, these ions are abundant elsewhere in the body.

After a short period of time, they are returned to where they are needed with the help of vigorous pumps of sodium and potassium.

Therefore, when you pause and rest, these ions are replenished throughout your muscles, relieving muscle fatigue.

The more regularly you exercise, the longer it takes for muscle fatigue to set in each time.

That's because the stronger you are, the fewer times you have to cycle the nerve signals from your brain to your muscle contractions to lift a certain amount of weight.

Fewer cycles slow down the depletion of ions, so as your fitness improves, you will be able to exercise for longer periods of time at the same intensity.

Many muscles grow with exercise, but the larger the muscle, the greater its ATP reserves and its ability to remove waste products, so fatigue lasts even longer.

In the 1600s, the Dutch East India Company hired hundreds of ships to trade gold, porcelain, spices, and silk around the world.

However, carrying out this large-scale operation did not come cheap.

To fund the expensive voyages, the company turned to private individuals, individuals who could invest money to support the trip in exchange for a portion of the ship's profits.

This practice allowed the company to embark on even more spectacular voyages, increasing profits for both itself and prudent investors.

The Dutch East India Company sold these shares in coffeehouses and shipping ports across the continent, unwittingly inventing the world's first stock market.

Since then, the company has been raising money from aspiring investors to support businesses of all kinds.

And today, the stock market has schools, careers, and even entire television channels dedicated to getting it right.

However, the modern stock market is far more complex than it was in the beginning.

So how are companies and investors using the market today?

Let's imagine that a new coffee company has decided to enter the market.

First, the company advertises itself to large investors.

If they think the company is a good idea, they take the first step in investing and then sponsor the company's initial public offering (IPO).

This allows the company to enter the official public market and allow shares to be purchased by companies and individuals who believe the business can be profitable.

By purchasing shares, those investors become partial owners of the business.

Their investments help the company grow, and as the company becomes more successful, more buyers may see the potential and start buying shares.

As the demand for these stocks increases, so too will their prices, increasing the cost to future buyers and increasing the value of shares in companies that people already own.

For the company, this increased interest helps fund new initiatives and also increases overall market value by showing how many people are willing to invest in their ideas.

However, the opposite can also happen if for some reason the company starts to look less profitable.

When investors think their stock is going to fall in value, they sell it in hopes of making a profit before the company's value falls further.

When stocks are sold and demand for stocks falls, stock prices fall, and so does the market value of the company.

This could result in huge losses for investors unless the company starts to turn a profit again.

This seesaw of supply and demand is influenced by many factors.

Companies are subject to unavoidable market forces, such as fluctuations in material prices, changes in production technology, and fluctuations in labor costs.

Investors may be concerned about a change in leadership, bad publicity, or larger factors such as new legislation or trade policy.

And, of course, many investors are prepared to sell valuable stocks for personal gain.

All these variables create daily noise in the market and can make a company appear more or less successful.

And in the stock market, when it looks like it's going down, it loses investors and often loses its true value.

Human confidence in markets has the power to trigger everything from booms to financial crises.

And it's this hard-to-track variable that makes most experts recommend reliable, long-term investments over trying to make quick cash.

But experts are constantly building tools to increase their chances of success in this highly unpredictable system.

But the stock market isn't just for the rich and powerful.

The dawn of the Internet allowed ordinary investors to buy stocks in exactly the same way as large investors.

And more people will learn about this complex system and be able to trade stocks, support the business they believe in, and pursue their financial goals.

The first step is to receive an investment.

But what if you have a very obvious problem in front of you?

What everyone was talking about, what directly affected you.

Do you want to do everything you can to fix it before things get worse?

Don't be too sure.

We are all far more likely to miss what is in front of us than we would like to admit.

And indeed, there are things in business, in life, in the world, that we are most likely to turn a blind eye to precisely because they pose a threat to us.

So I would like to give an example of my world, economic policy.

So when Alan Greenspan was head of the Federal Reserve, all his job was to keep an eye on the problems of the U.S. economy and keep them from spiraling out of control.

So after 2006, when real estate prices peaked, more and more respected leaders and institutions began sounding the alarm about dangerous loans and dangerous market bubbles.

As you know, everything fell apart in 2008.

Banks have collapsed, global stock markets have lost nearly half their value, and millions have lost their homes to foreclosures.

And at the bottom, nearly 1 in 10 Americans are unemployed.

So after things calmed down a little, Greenspan and many others did a postmortem and said, "Nobody could have predicted that crisis."

They called it "Black Swan".

It was unimaginable, unpredictable, and utterly improbable.

Total surprise.

However, it wasn't always so surprising.

For example, my apartment in Manhattan nearly doubled in value in less than four years.

I saw the writing on the wall and sold it.

(Laughter) (Applause) So many others saw the warning and spoke publicly, but it was ignored.

So while we didn't know exactly what the crisis would look like, not the exact parameters, we all knew that what was coming towards us was just as dangerous, visible and predictable as a giant gray rhino rushing towards us.

Black Swan fits the idea that we have no power over our future.

And unfortunately, the less power we think we have in control, the more likely we are to downplay it or ignore it entirely.

And this dangerous dynamic masks another problem. This means that most of the problems we face are very probable, obvious and visible, yet we have not yet done anything about them.

So I created the gray rhino trope to fill what I felt was an urgent need.

With the same passion that people had for the Black Swan, this time to allow us to have a new perspective on things that are so obvious, so probable, yet still ignored.

That's a gray rhinoceros.

Once you start looking for gray rhinos, you will start seeing headlines about gray rhinos on a daily basis.

So what I saw in the headlines was a new big gray rhino, a new likely financial crisis.

And what have we learned in the last ten years?

So if you listen to Washington and Wall Street, you can be forgiven for thinking that only smooth sailing lies ahead.

But in China, where I spend most of my time, the conversation is quite different.

The entire economic team, down to President Xi Jinping, has been very specific and clear about financial risks like the gray rhino and how to tame them.

Indeed, China and the United States have very different governance systems, which affects what they can and cannot do.

And many of the root causes of economic problems are quite different.

But it is no secret that both countries have problems of debt, inequality and economic productivity.

So why are the conversations so different?

In fact, you can ask this question for just about anyone, not just countries.

A car company that puts safety first and a car company that doesn't mind recalling shoddy cars until people die.

Grandparents write tributes and prepare menus for funeral lunches in preparation for the inevitable.

(Laughter) So did my grandparents.

(Laughter.) And all but the last date was inscribed on the tombstone.

But on the other side are the grandparents, who don't sort out the last problem, get rid of all the junk they've accumulated over the decades, and leave it up to their kids to handle it.

So what's the difference between one side and the other?

Why do some people see things and deal with them, while others just look away?

So the first one is about culture, society and the people around you.

People are more likely to think the danger is small if they expect people to help them when they fall.

And in doing so, you can capitalize on good opportunities as well as bad ones.

For example, risking criticism for talking about dangers that no one wants you to talk about.

Alternatively, seizing a slightly scary opportunity is also a gray rhino in its own way.

In short, the United States has a very individualistic culture and acts alone.

And paradoxically, this makes many Americans less open to change, which is good risk taking.

In China, by contrast, people believe that the government will prevent problems from happening, and they believe that, although this is not always the case.

They are more likely to take certain risks because they believe they can rely on their family.

Whether it's buying property in Beijing or being more open about the fact that a change of direction is needed, the speed of change in China is truly amazing.

Second, how much do you know about a situation and how much are you willing to learn?

And are you willing to see things, even if they are not what you want?

Many of us are very unlikely to pay attention to things we just want to get rid of, things we don't like.

But we have the opportunity and the ability to fix those blind spots.

I spend a lot of time talking to people from all walks of life about the gray rhinos in their lives and their attitudes.

And you might think that the more risk-averse and risk-sensitive people are, the less likely they are to accept change.

But the opposite is true.

It turns out that people who are aware of their surroundings and try to plan are the ones who can tolerate more risks, good risks, and deal with bad ones.

That's because the more we seek information, the more power we have to do something about what we fear.

That brings us to our third point.

How much control do you feel you have over a gray rhino in your life?

One of the reasons we don't act is that we often feel so helpless.

When you think about climate change, it can feel like it's too big for us alone to make a difference.

That is why some people live their lives in denial.

Others blame everyone but themselves.

Like my friend who said he wouldn't give up his SUV until he stopped building coal-fired power plants in China.

But we have the chance to change.

No two of us are the same.

Each of us has the opportunity to change the attitudes of ourselves and those around us.

So today, I want you to start an open and honest conversation with the people around you about the gray rhinos in our world, and be brutally honest about how well we get along with them.

In America, we often hear people say, "Of course, the obvious problems should be addressed, but if you can't see what's in front of you, you're either stupid or ignorant."

That's what they say, and I couldn't agree more.

If you can't see what's in front of you, you're not stupid, you're not ignorant, you're human.

And when we all recognize that common weakness, it empowers us to open our eyes, see what's in front of us, and act before we're trampled.

(applause)

When you look in the mirror today, you see a justice and education scholar at Columbia University, a youth leader, an activist, and a future New York state senator.

(cheers) I see all that and a man who spent a quarter of his life in state prison. Six years, to be exact, spent in prison on Rikers Island as a teenager for an act that nearly cost him his life.

But it wasn't the harshness of the punishment and legal system I faced as a teenager in an adult prison that got me from there to here.

Instead, it was the classroom learning environment that taught me things I thought were impossible for me, or for our entire justice system.

A few weeks before my parole, my counselor encouraged me to enroll in a new college course offered in prison.

It was called "Internal Criminal Justice".

But that seems like a no-brainer, doesn't it?

In the end, the class consisted of eight incarcerated men and eight assistant district attorneys.

Co-led by Columbia University psychology professor Geraldine Downey and Manhattan state attorney Lucy Lang, the course was the first of its kind.

To be honest, this wasn't how I envisioned starting college.

My heart was in shock from the first day.

I assumed all the prosecutors there would be white.

But I remember walking into the room on the first day of class, seeing three black prosecutors, and thinking, “Wow, black prosecutors are amazing!”

(Laughter) By the end of the first session, I was fully engaged.

In fact, a few weeks after my release, I found myself doing what I prayed I would never do.

I went straight back to jail.

But thankfully, I was able to join my classmates as a simple student this time.

And this time I had to go home after class.

In the next session, we discussed what brought each of us to this point in our lives and brought us into the classroom together.

I finally got enough room to tell everyone in the room the truth about where I came from.

My sister and I talked about watching her mother suffer years of abuse at the hands of her stepfather, run away, and find herself living in a shelter.

I talked about taking an oath to keep my family safe.

I even explained how at 13 I felt more like a soldier on duty than a teenager.

And like any soldier, this meant a mental burden on my shoulders, and I hate to say it, but I had a gun on my hip.

And just days after my 17th birthday, that mission failed completely.

As my sister and I were walking to the laundromat, a crowd of people stopped in front of us.

Out of nowhere two girls attacked my sister.

Confused about what had happened, I tried to pull one girl away when I felt something cross my face.

I was so high on adrenaline that I didn't realize a man had jumped out of the crowd and cut me.

As I felt the warm blood oozing down my face and saw him raise the knife at me again, I turned to defend myself, drew the gun from my waistband and squeezed the trigger.

Thankfully he didn't die that day.

My hands were shaking, my heart was racing, and I was paralyzed with fear.

From that moment on, I felt a lifelong regret.

I later found out that they mistakenly attacked my sister because they thought she was someone else.

As scary as it was, it was clear that I had neither the training nor the qualifications to become a soldier that I thought I needed to be.

But in my neighborhood I felt safe only with a weapon.

Now, after going back to the classroom and hearing my story, the prosecutor could say that I never wanted to hurt anyone.

I just wanted to go home.

As I listened to story after story from other inmates in the room, I could literally hear their faces slowly changing.

A story that has trapped many of us in a vicious cycle of imprisonment from which most of us have been unable to break out.

And yes, there are people who commit horrific crimes.

But the life stories of these people before they committed these acts were the kind of stories prosecutors had never heard before.

And when it was the prosecutor's turn to speak, I was surprised too.

They weren't emotionless drones or robocops preprogrammed to send people to jail.

They were sons and daughters, brothers and sisters.

But above all they were good students.

They were ambitious and motivated.

And they believed that the power of law could be used to protect people.

They had a mission that was very clear to me.

Halfway through the course, fellow incarcerated student Nick expressed concern that prosecutors were sneaking around racial prejudice and discrimination in our nation's criminal justice system.

Now, anyone who has been to prison knows that it is impossible to talk about judicial reform without talking about race.

So we quietly cheered for Nick and listened intently to the prosecutor's reaction.

No, I don't remember who said it first, but when senior prosecutor Chauncey Parker agreed with Nick and said he was determined to end the mass incarceration of people of color, I believed him.

And we knew we were headed in the right direction.

We are now working as a team.

We explored new possibilities and began to uncover the truth about the judicial system and how real change is happening to us.

For me it was not a compulsory program in prison.

Instead, he listened to the advice of elders sentenced to spend the rest of his life in prison.

These people have helped me restructure the way I think about being a man.

And they instilled in me all of their aspirations and goals in hopes that I would never return to prison, and that I would serve as their ambassador to the free world.

As I spoke, I saw a prosecutor's lights come on. The prosecutor said what he took for granted. It is that I have changed despite my imprisonment, not because of my imprisonment.

It was clear that these prosecutors didn't think much about what would happen to us after winning a conviction.

But through the simple process of sitting in a classroom, lawyers began to realize that it was not in the community's or our interest to keep us locked up.

Towards the end of the course, prosecutors were excited as they discussed plans for life after release.

But they didn't realize how hard it would really be.

I can literally still see the shock on her face when one of the young ADAs assaulted her. The temporary IDs given to us on our liberty showed that we had just been released from prison.

She never imagined how many barriers this would create as we reintegrated into society.

But I also found that she genuinely sympathized with the choice between us going home and sitting on a bed in the shelter or on the couch in our relatives' overcrowded apartment.

What I learned in class was put to good use in concrete policy proposals.

We submitted our proposals to the State Commissioner of Corrections and the Manhattan Attorney's Office at our graduation ceremony in a packed Columbia Auditorium.

As a team, we couldn't have imagined a more memorable way to end the eight weeks.

And just ten months after coming home from prison, I was again in a strange room, invited by the NYPD Commissioner to share my views at the Police Summit.

And as I spoke, I recognized a familiar face in the audience.

It was that lawyer who was in charge of my case.

Looking at him, seven years ago in court, listening to him recommending a long prison sentence, I felt as if my young life was meaningless and without possibility.

But this time things were different.

I shrugged it off and went over to him and shook his hand.

He seemed happy to see me.

I was surprised, but happy.

He acknowledged how proud he was to be in the room with me, and we started talking about working together to improve conditions in our community.

And today, I'm carrying on all of this experience in launching the Justice Ambassador Youth Council at Columbia University to organize young New Yorkers—some already trapped and some still in high school—with city officials.

And in this class, everyone brainstorms ideas to improve the lives of the city's most vulnerable youth before they face trial in the criminal justice system.

It is possible if we do the work.

Our society and judicial system make us believe that we can lock up our problems and punish our way out of social challenges.

But that is not the reality.

Imagine with me for a moment. Imagine a future where no one can become a prosecutor, judge, police officer, or even parole officer without first sitting in a classroom and learning and connecting with the very people who hold their lives in their hands.

I do my part to foster the power of conversation and the need for collaboration.

Through education we arrive at truths that are inclusive and unite us all in the pursuit of justice.

For me, it was a whole new conversation, a new kind of classroom that taught me how both my way of thinking and the criminal justice system can be transformed.

They say the truth will set you free.

But I believe it's about education and communication.

thank you.

(applause)

When I first arrived in beautiful Zimbabwe, it was difficult to understand that 35 percent of the population is HIV positive.

Only after being invited to people's homes did I come to understand the human toll caused by this epidemic.

For example, this is Herbert and his grandmother.

When I first met him, he was sitting on Grandma's lap.

He was orphaned when his parents died of AIDS, and his grandmother took care of him until he too died of AIDS.

He liked to sit on her lap because lying on his own bed was painful.

When she got up to make her tea, she put him on my lap, and I had never felt a more haggard child.

Before leaving, I actually asked him if he could get me anything.

I thought I would ask for toys or sweets, but I was asked for slippers because my feet were cold.

This is Joyce, 21 years old in this photo.

Single mother, HIV positive.

I took pictures of her before and after the birth of her beautiful baby girl, Issa.

And last week, I was walking down Lafayette Avenue in Manhattan when a woman I didn't know called me to tell me that Joyce had died at the age of 23.

Joyce's mother is now caring for her daughter, along with many other Zimbabwean children orphaned by the plague.

Now for some stories.

In every photo there is a person with a full life and a story worth telling.

All these photos are from Zimbabwe.

Chris Anderson: Kirsten, can you tell us your own story of how you got to Africa?

Kirsten Ashburn: Hmm, okay.

CA: But -- KA: Actually, at the time, I was producing a fashion photographer.

And I read the New York Times all the time and was appalled by the stats and numbers.

I was just scared.

So I quit my job and decided it was the subject I wanted to work on.

And I actually went to Botswana first and spent a month there -- this was December 2000 -- then I went to Zimbabwe for a month and a half and then came back again this March of 2002 and stayed in Zimbabwe for another month and a half.

CA: Great story, thank you.

KB: Thanks for showing these.

A rabbit is trying to play the church organ, a knight is fighting a giant snail, and a naked man is blowing a trumpet with his butt.

These bizarre drawings, painted on parchment and parchment with squirrel-hair brushes by monks, nuns and urban craftsmen, are found in the margins of the most valuable books of the Middle Ages.

Their illustrations often tell a second story as rich as the text itself.

Some images appear in various illuminated manuscripts, often reinforcing the religious content of the books they embellish.

For example, a porcupine picking up fruit with its spine could represent the devil stealing the fruit of faith, or Christ taking on the sins of mankind.

Medieval lore held that a hunter could only catch a unicorn with its horn resting on the lap of a virgin, so the unicorn was considered either a sexual seduction or a symbol of Christ captured by his enemies.

Rabbits, on the other hand, could symbolize man's amorous nature, and were able to reclaim themselves through attempts to create sacred music despite failure.

All of these references were familiar to medieval Europeans from other art forms and oral tradition, but some became more mysterious over the centuries.

Today, no one can say exactly what the common motif of knights fighting snails means, or why knights often seem to lose.

The snail may be a symbol of the inevitable death that defeats even the strongest of knights.

Alternatively, it may represent humility and the need for a knight to break his pride.

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 was probably an abbreviation used to express disapproval or add irony to the action in the text.

Illumination may also be used to make subversive political commentary.

The text of the Smithfield Act details the laws of the Church and the penalties for lawbreakers.

In the margins, however, foxes are depicted hanging from geese, which may allude to the common people's opposition to powerful oppressors.

In Chronica Majora, Matthew Paris summarized the scandal surrounding the death of Griffin, Prince of Wales, after he fell from the Tower of London.

Some thought he had fallen, others thought he had been pushed, Paris writes.

He made his own interpretation of the margins that depict the prince falling to his death while trying to escape onto a rope made of bedsheets.

Some margins told stories of a more personal nature.

The Luttrell Psalms, a book of psalms and prayers commissioned by Sir Geoffrey Luttrell, depicts a young man catching birds with a net while a young woman straightens her hair.

His shaved head is elongated, indicating that he is a derelict cleric.

This alludes to a family scandal in which a young clergyman fled with Sir Geoffrey's daughter Elizabeth.

The family's personal spiritual advisor probably drew it into the book to remind clients of their failures and encourage their spiritual growth.

Some artists even painted themselves in manuscripts.

The opening image of Christine de Pisan's collection of works shows him presenting a book to the Queen of France.

The Queen was so impressed with De Pisan's previous work that she commissioned her own copy.

Such royal patronage enabled her to set up her own publishing house in Paris.

The tradition of illuminated manuscripts lasted for over a thousand years.

These books are created by individuals or teams and have a wide range of uses, including personal prayer aids, church service books, textbooks, and amulets to carry in battle.

Throughout this variation, the tricky little paintings in the margins provide a unique window into the mind of the medieval artist.

In other words, for the first time in modern American history, five generations interacted in the workplace.

Veterans born between 1922 and 1943 are known as the greatest generation, the mature, silent generation.

They are known for self-sacrifice, respect for authority, and work itself is a reward.

Soon after that came the Boomer generation, born between 1944 and 1960.

A generation characterized by diligence.

In fact, we can thank this generation for the word "workaholic."

They love competition and love effective communication.

And if you haven't retired yet, you're thinking of retiring.

Generation X, also known as the lost or latchkey generation, were born between 1961 and 1980.

This is the smallest generation sandwiched between the Boomers and the massive Millennials.

More parents divorced in this generation than in any previous generation.

They're also the first generation to tell us about work-life balance and the first to actually demand it in the workplace.

And millennials born between 1981 and 2000, the generation where everyone gets a ribbon.

I never thought there was a time when technology didn't exist in our homes.

They are incredibly down-to-earth, hopeful, and determined.

They think they are going to change the world, in fact I believe they will.

They may be a little idealistic, but in the last few years alone, we've seen millennials surpass Generation X to become the most representative generation in the workforce.

In fact, more than one in three people in the U.S. workforce are millennials.

And soon to be joined are Gen Zs born after 2000, high school interns, or soon-to-be high school graduates.

Now, when you open up your Internet browser and look up Amazon or search your favorite search engine, you might think there's a literal war going on at work.

I see blog topics like '17 Reasons Millennials Are the Worst Generation'.

and "why baby boomers ruined it for everyone".

Or "Bridging the Great Generational Gap".

It's like it's become this 'West Side Story' where baby boomers come in one door and millennials come in another door, the lobby, and just fight each other all day, complain, go home, do the same thing, and go back to work, right?

What if I told you that these generations might not exist?

I've spent some time thinking about and researching this, but neither my fellow researchers nor I know exactly if these generations are real.

And indeed, even if we can agree that these groups exist, we certainly cannot agree on who belongs to them.

And they last 20 years or so.

So at any point in history, a 1-year-old and a 20-year-old share the same values, want the same things at work, and the same stereotypes can work in their favor or against them.

And indeed, different regions of the world define these generations differently.

So you can't even compare generations from different parts of the world.

And in many ways these stereotypes about generations have created a self-fulfilling prophecy that people will begin to act as if they belonged to this generation because they said it was real.

I don't know if it is.

And indeed, the idea of ​​this generation is deeply rooted in American culture.

When we talk about generations people know exactly what we are talking about.

In fact, people have many thoughts and feelings about each of these generations.

And I'll tell you how I know it.

I did what any hot-blooded American or pre-tenured scholar does when he has a question.

And this is what I learned.

Google is algorithmically based to provide popular terms and hit suggestions based on what other people are searching for on the same topic.

And I got a really good idea of ​​what people think about each of these generations.

please look.

I learned that baby boomers are conservative and that Americans consider them stupid.

The worst generation, they're mad, apparently they're racist and they matter so much.

Looking at Generation X, I realized that Generation X is a cynical group, they are angry and known as the Lost Generation. we know it They are the smallest generation.

Apparently they are stupid too.

(Laughter.) And most of them are complaining about baby boomers.

Hey millennials, here's what I learned about us.

So we stick with food.

(Laughter) We're idiots too, oh!

We're lazy, we're sensitive, we're dismissed, we're hated, and we think we're important.

And perhaps the scariest search result on the internet is that Gen Z is screwed.

(Laughter) Well, I've spent five years talking to leaders and followers in various organizations.

And this is what I noticed.

Generations are not part of the conversation -- Generations are the conversation at work.

What I've learned is that we work under the assumption that Google's results are true.

So I think organizations are now desperate to figure out how to "manage" a multi-generational workplace.

"manage" it.

We manage everything.

We are gearing up for this millennial wave.

So we prepare for hurricanes, right?

We prepare for MCAT and prepare for natural disasters.

Why are you gearing up for work at 23?

(Laughter) I've spoken to these organizations and heard great things they're doing to create workspaces where everyone feels connected, self-motivated, and thriving.

But I've also heard some really incredibly dumb ideas about how to navigate a multi-generational workplace.

are you ready?

Here is what i saw.

I visited an organization and they adopted the idea that if you can see it, you can be it too.

A really important concept.

But I think they blew it.

Pictured on the wall of an ideal multigenerational workplace. Because if you can see it, you can be it too.

(Laughter) Or something like this.

(laughs) I don't want to work here.

(Laughter) It seems like you can't wear color here. HR has a serious problem with heel jumpers. I promise you, okay?

I recently spoke with an organization that decided not to have ball pits in their break rooms. Because that's how you keep millennials alive.

We are 30, not 3.

(Laughter.) And actually, I know a young man who was a millennial at the time, and she was told that if she wanted people to take her seriously just because she was a millennial, she had to wear shoulder pads.

yes.

If she wasn't wearing shoulder pads, people younger than her and people older than her wouldn't take her seriously.

80's same shoulder pads that are not sold anywhere else.

This young woman had two graduate degrees.

This young lady was me.

And is this the best we could come up with?

How to survive a multi-generational workplace...shoulder pads?

(Laughter) This is also what I've learned from talking to organizations that employ a wide range of people of different ages.

We are much more alike than we are different.

And we hear this consistently.

People want important work, they want flexibility, they want support, they want gratitude, they want better coffee.

But none of these things have anything to do with generations.

Sure, you'll find that there are small differences in what people want.

I know 20-year-olds and 60-year-olds go home and do different things.

they have different values.

At least when it comes to non-work events.

But I think what happened was that the focus on intergenerational cohorts, groups of people, created a space where people forgot they were people.

And to find out who they really are and who we really work with, we have to find a better way to navigate this multigenerational workplace than the ball pit.

Call me one of the idealist millennials. But I think we can get there.

And I think the idea is not that difficult.

What if we fundamentally, easily, and not easily meet people where people are?

Individualize our approach.

I have never met a generation.

I have had many conversations with people who happen to identify with a particular generation.

I know 80 year olds texting and 23 year olds knitting blankets.

None of these are typical of that generation, right?

Nilofer Merchant -- she is an innovation thought leader -- she says we need to meet people where we stand alone in the world, according to our unique histories, experiences and aspirations.

But this requires flexibility and curiosity.

And what happens when we meet people in their own existence, where they stand in the world, is that we find baby boomers frightened who are always pretending to be "angry" at work.

Because he's been working every day since he was 16, and on Mondays, he never goes to work again, sooner than you think.

he has a plan

It takes me about a week and a half to do everything on my retirement list.

But what then?

Why not give someone who might be a little intimidated a little respite?

Or someone from Generation X with 4 dropouts, 3 kids, two hands, and trying to keep the handle of the bus.

Admittedly, she can be a little aloof at work.

Maybe she's a little more independent, maybe she's just exhausted.

Or is it the millennial who asks for a raise after two months because "it's entitled"?

Perhaps it's because that generation of college graduates has more debt than the generation before them, and they need the money to pay the rent to keep going.

And suddenly when we meet people in a world where only that person exists, where only that person stands, we are no longer talking about generations.

We're talking Jim, Jen and Candace.

So here is my challenge to us.

Choose just one person and explore that person's uniqueness.

and learn.

And when the time is right, teach.

And find out what they bring to work that others can't bring to work. Because it makes the job richer.

And then do it again.

And do it again.

And someday we won't be able to work across generations.

We work collaboratively with people.

So I think you have to meet people there to really understand the beauty of a multi-generational workplace.

And that doesn't require us to unpack and live there with them.

But at least sometimes we may find it to be a beautiful place to visit.

So I don't think we need to debate which generation is the most angry, or the most entitled, or the most obsessed with food.

We all come to class, work, and go home feeling a little tired and sometimes a little worn out.

Perhaps let's do our best to humbly meet where people are, how they show up in the day, generations and all.

And I think we can all agree, at least in those moments when it feels like a generational war, shoulder pads aren't the solution.

(laughs) Thank you.

(applause)

(Director Bailey in English) Hello everyone.

My name is Yuko Morita.

This is the facility dog ​​Bailey.

As a child, were you afraid of being shot with a gun?

When you get your flu shot at school, you've probably asked your friends, "Did it hurt?" It was painful? 'As you know, children are very scared of injections and blood draws.

Hospitalized children have to have their blood drawn multiple times.

Some children need to drill a large needle into the spine and aspirate the bone marrow.

This dog, Bailey, has the magical power to make children say, "If I had Bailey, I could endure 100 more times."

He is a very capable dog.

In terms of curing diseases, the level of medical care in Japan is said to be top-notch.

However, while "tolerance" has been regarded as a virtue in Japan, it is said that the quality of hospital life is not sufficiently supported.

I used to work as a registered nurse at a children's hospital in Tokyo.

One day, the mother of a hospitalized child said, "This is like being in prison."

I thought I had worked hard for the sake of the children, so I was very shocked to hear that.

In fact, hospitalized children are not supposed to go out even for a walk.

They are not allowed to eat their favorite foods.

They have little fun.

Some children stop smiling.

Come to think of it, you might as well call it a prison.

At that time, I belonged to an NPO corporation called "Shine On!". The kids said they would let me be their service dog handler.

This non-profit organization was founded to provide emotional support to children and their families suffering from childhood cancer and other incurable diseases.

At that time, all I knew was that the dog had been taken to a children's hospital and was working as part of the medical staff. There were many facility dogs working in Europe and America, but of course there were none in Japan. That was all I knew about institutional dogs.

I was thrilled to think, ``If there were service dogs working in this ward, the hospital life for the children, which was called a prison, would be much happier.''

Without hesitation, I said, "Yes, I would love to."

There are no training institutions for facility dog ​​programs in Japan.

Both Bailey and I were trained at a training center in Hawaii.

I also practiced following around elderly facility dogs and their handlers at a children's hospital in Hawaii.

To my surprise, the service dog ended up in the ICU.

I had a kid who had just had surgery, had a half-shaved head, and had a huge scar on his head.

The child frowned painfully.

I was very worried, thinking, "Is it really okay to go in such a serious situation?" The facility dog ​​entered and climbed onto the bed right next to the child lying in a tube and slept with the child.

Then the child relaxed.

The child hugged the dog and closed his eyes, even though it was hard to move.

The child looked very calm and easy.

When I saw it, I thought, "Wow!", and was so excited that I wanted to fill the whole ward with smiles, and went back to Japan with Bailey.

However, facility dogs are completely unheard of in Japan.

The Western way of thinking about dogs is completely different from the Japanese way.

In Europe and America, it is very common to keep a dog as a member of the family in the house.

On the other hand, Japan has a history of keeping them outside.

It was outrageous to keep a dog in the ward, that was the idea of ​​Japanese hospitals.

We also had dogs who volunteered to visit hospitals in Japan from time to time.

But there was no precedent for taking dogs to the hospital every day and thinking of dogs as medical workers.

What was right in Hawaii was never right in Japan.

We desperately searched for a hospital that would accept Mr. Bailey as a staff member.

Finally, I was accepted to Shizuoka Children's Hospital.

But in reality, people said, "Can't you replace dogs with dog-robots?"

At first, I was only allowed to enter one ward.

So, the day's round was over in a few minutes.

I arrived at work and an hour later it was time to go home.

"I don't think Japanese culture would make people want to introduce a facility dog ​​program." I had nothing but negative thoughts.

But the truth is, the kids needed Bailey.

Five years have passed, and now it is accepted in almost all wards.

Bailey makes a positive difference for both children and their families. That's what doctors and nurses are starting to realize.

There was a visually impaired child who always panicked and screamed when blood was drawn.

But with Bailey by his side, they were distracted by patting Bailey's head so the child could have the blood test without crying.

Another child, completely immobile from post-surgery pain, suddenly got up to see Bailey.

It was a big surprise for doctors.

A family suddenly told that their child has cancer will act like nothing happened, so as not to make the child nervous.

But a person cannot keep his emotions in check forever.

It is important to cry sometimes.

If you are human, you will feel the desire to say something.

But for Bailey, they don't have to say anything if they don't want to.

In the hallway of the hospital, I saw a mother crying as much as she could after hugging Bailey, then returning to her child's bed with a relaxed expression.

Bailey was a positive influence on their family as well.

It turns out that there are three important bonds for facility dogs.

One is Bailey's bond with the children, another is Bailey's bond with the handler, and another is Bailey's bond with the medical staff.

These are three important bonds with Bailey.

The first bond is that Bailey sees the same children over and over because he works at the same hospital every day.

For children, having a dog is not enough.

Bailey who comes every day is really important.

Bailey builds a bond with children, so they can be brave and do their best.

Almost all kids will eventually like Bailey, even if they are cynophobic.

To children, Bailey is a teammate with a disease-fighting tail.

Bailey can also enter the operating room with her child.

Even adults are afraid of surgery, right?

I have to spend a scary time from the ward to the theater, wondering if it hurts and being scared.

But children can hold Bailey's lead, walk with them, and lead Bailey as he walks to the theater with a smile on his face.

It's a privilege to walk with everyone's favorite Bailey, like no one else!

Some children playfully walk around Bailey's fluffy tail as if they were cats.

“Bailey wagging his tail means good luck,” says a child with a smile.

In this way, scary feelings turn into exciting ones. It encourages children to go to the theater.

The second bond is between a facility dog ​​and its owner who live together 24/7.

We always spend holidays together.

This is very important; there's no point in getting together at work and saying "bye-bye" past five o'clock.

We go to bed at night and Bailey sleeps with his head on my arm.

The bond between a facility dog ​​and its handler is the foundation for a facility dog ​​to work professionally.

Only my bond can convince Bailey to trust me and work with me.

But the truth is: You'd think a training dog would listen to you, but Bailey is a stubborn guy who only goes where he wants to go.

In a direction he doesn't want to go, he likes to do this.

Can you see him holding on with all his might?

Keep your feet firmly on the ground, your nails pointed, and never go where you don't want to go.

As I walk down the street, I sometimes struggle with Bailey sitting there.

Passers-by always say with a smile, "It's troublesome."

But he never refused to go to the hospital.

On the contrary, they may squat down and return to the ward without even trying to go home.

Dogs easily understand what humans think about them.

Bailey loves the hospital very much because there are so many people who love her.

Dogs and humans influence each other. That's where the facility dog ​​is.

This is why non-sentient toy dogs cannot achieve this.

A robot dog cannot do this.

A third bond is between Bailey and the medical staff.

Facility dog ​​handlers are medical personnel.

The reason why only health care workers can be facility dog ​​handlers is because the work of a facility dog ​​involves healing the body as well as healing the mind.

Bailey and I occasionally participate in conversations that determine patient care.

Also, understand how patient children are and how to approach this patient.

I will also write it on my chart.

As such, being involved in a specific purpose is something that only facility dogs can do, and why facility dog ​​handlers need to be qualified as medical practitioners.

Bailey and I have been working in Japan for five years.

We have met thousands of children.

We once met a child who was terminally ill and could not eat.

He wanted to eat, but he could not. That was his situation.

Given the short time, his family and nurses hoped he would be able to enjoy some of his food.

Then came the proposal to have Bailey present at the dinner table.

With Bailey, the child sat smiling happily.

"Bailey, look at me," he said, but managed to put a few mouthfuls of spaghetti into his mouth.

I was also able to voluntarily enjoy the ice cream instead of being forced to.

Only Bailey's bedside presence could make that level of change.

The bad impression of the hospital changed so much that the children even said, "I want to go to the hospital to see Bailey."

With Bailey, your child will have double the fun!

With Bailey, children can share their tears and fears.

Most children leave the hospital safely.

But sadly, some children have to leave this world forever, and Bailey sometimes sleeps with them until their last moments.

We say, "I know, there's Bailey." "It's warm, isn't it?" to children.

A sad but warm time will pass.

We sometimes attend children's funerals.

Can you imagine how a parent feels when they have to close their child's coffin lid?

In fact, every family member says, "We were so happy to have Bailey."

they always say so.

"Before Bailey was born, being in the hospital was pretty heartbreaking."

"Bailey made a huge difference in our child's life."

This is what family members said.

Families who have lost a child will think of the child every day for the rest of their lives.

He remembers his child as "a poor soul who has undergone too many painful surgeries." Or they may remember their child as "the laughing child who slept with Bailey just before he died." It feels completely different, doesn't it?

We hope to bring some happiness to their heartbreaking memories.

I hope that the bereaved families will remember the smiles of their children as much as possible.

I strongly believe that the facility dog ​​system is not an option, but a necessity for hospital treatment.

Japanese medical care is said to be of the highest standard in the world.

I think that we need an environment that not only cures illnesses, but more proactively cures them.

Not much fun for the patient.

There are many facility dogs in Europe and the United States, but there are only two in Japan.

I would like to introduce facility dogs as standard in Japanese hospitals and make Japanese hospitals enjoyable for patients with chronic diseases.

Many children who have died are watching over us from heaven.

For those children, I want to make Japan's medical field a place where they can proudly say, "It's a good hospital." (applause)

This means "I am laughing".

So is it.

It means "rat".

"Cat."

Here's the story.

Beginning of the story, this means a man, and it is a passerby's ponytail.

Here it happens.

These are then.

This is the cassette tape that the girl put in the cassette tape player.

she wears it every day

It is not considered vintage. She just likes certain music to sound a certain way.

Look at her posture It's worth noting.

because she dances

Now he's embracing all this and thinking, "Honestly, dude, what are my chances?"

(Laughter.) And he could say, "Oh my God!"

Or "I wholeheartedly support you!"

I'm laughing out loud.

"I want to hug you."

But he comes up with it.

He tells her, "I'd like to hand-paint your portrait on a coffee mug."

(Laughter) We put crabs inside.

Add water.

7 kinds of salt.

What he means is that the sudden thought of standing on land and begging at sea came to him.

He says, "You look like a mermaid, but you walk like a waltz."

Then the girl said, "Huh?"

Then the man replied, "Oh, I know, I know.

I think my heartbeat might be inappropriate Morse code.

At least, that's what it looks like.

I'm kind of like the junior varsity cheerleader at times - swearing, awkward silences, and very simple rhymes.

Talking to you now, I'm not really even a man.

I'm a monkey -- (laughter) -- blowing a kiss to a butterfly.

But I'm still proposing to you, so see you.

First quickly and then a lot.

I'm thinking about the southwest corner of 5th and 42nd at noon tomorrow, but I'll be here until you show up, ponytail or not.

Hell, just a ponytail.

I have a pencil, so please lend me it.

You can put it in your cell phone. ”

But the girl didn't move, didn't smile, didn't frown.

She just says "No, thank you."

Look?

[ "You don't have to write."] (Applause)

When you're on an airplane, you feel a sudden tremor.

Out of the window, nothing seems to be happening, but the plane continues to rattle you and other passengers as it passes through atmospheric turbulence.

It may not be reassuring to hear this, but this phenomenon is one of the pervasive mysteries of physics.

In more than a century of studying turbulence, we have found only a few answers about how turbulence works and how it affects the world around us.

However, turbulence is ubiquitous and occurs in virtually any system with moving fluids.

This includes airflow in the respiratory tract.

blood flowing through arteries.

And the coffee in the cup while stirring.

Clouds are governed by turbulence, much like waves crashing along the coast or blasts of the sun's plasma.

If we could understand exactly how this phenomenon works, it would affect many aspects of our lives.

Here's what we know:

Liquids and gases generally have two types of motion. One is a steady and smooth laminar flow. and turbulence consisting of seemingly chaotic vortices.

Imagine incense sticks.

The laminar flow of smoke without ripples at the base is stable and easy to predict.

However, as it nears the top, the smoke accelerates, becomes unstable, and the movement pattern becomes chaotic.

That is the activity of turbulence, and turbulence has common characteristics.

First, turbulence is always chaotic.

It's not random.

Rather, this means that turbulence is highly sensitive to disruption.

A little tweaking either way will give you a completely different end result.

So even with a lot of information about the current state of the system, it becomes nearly impossible to predict what will happen.

Another important feature of turbulence is the different scales of motion exhibited by these flows.

Turbulence has many eddies of different sizes, called eddies, like vortices of different sizes and shapes.

All of these different sized vortices interact with each other, breaking up and becoming smaller and smaller until all motion is converted to heat in a process called an "energy cascade."

This is how we perceive turbulence, but why does turbulence occur?

Any flowing liquid or gas has two opposing forces: inertia and viscosity.

Inertia is the tendency of a fluid to keep moving, causing instability.

Viscosity acts against interruptions, making the flow laminar instead.

In thick liquids like honey, viscosity is almost always the priority.

Low-viscosity substances such as water and air are subject to inertia, causing instability and developing turbulence.

We measure where a flow falls on that spectrum using something called the Reynolds number, which is the ratio of inertia to viscosity of a flow.

The higher the Reynolds number, the more likely turbulence will occur.

For example, honey poured into a cup has a Reynolds number of about 1.

In the same water setting, the Reynolds number is close to 10,000.

The Reynolds number is useful for understanding simple scenarios, but it is useless in many situations.

For example, the movement of the atmosphere is greatly influenced by factors such as gravity and the rotation of the earth.

Or consider something relatively simple, such as the resistance on a building or a car.

Thanks to many experiments and empirical evidence, we can model them.

But physicists want to be able to predict them through physical laws and equations, just as we can model the orbits of planets and electromagnetic fields.

Most scientists believe that getting there will require improved statistics and computational power.

Very fast computer simulations of turbulence can help identify patterns that can lead to theories that organize and integrate predictions across different situations.

Other scientists believe that the phenomenon is so complex that such a full-fledged theory is never possible.

I hope we reach breakthroughs because truly understanding turbulence can have a huge positive impact.

That would include more efficient wind farms. Ability to better prepare for catastrophic weather events. Or even the power to manipulate a hurricane and drive it away.

And, of course, a smoother ride for millions of air passengers.

Zach Kaplan: Keith and I are leading the research team.

We research materials and technologies with unexpected properties. Over the past three years, we've found over 200 of these things, so we reviewed the library and selected the six that we thought were the most surprising to TED.

Of these six, the first I'll describe is in the black envelope you're holding.

It is sold by a Japanese company called GelTech. Let's open it.

Keith Schacht: So make sure you break it down into two parts.

What is surprising is that it is a strong magnet even though it is soft.

Zach and I have always been fascinated by observing the unexpected like this.

We've been wondering why for a long time, but only recently have we figured it out. It's that when you see the unexpected, your understanding of how things work changes.

If this is your first time seeing gel magnets and you thought all magnets were supposed to be hard, this one surprised you and changed your understanding of how magnets work.

ZK: Well, it's important to understand what the unexpected properties are.

But to really think about what this makes possible, I've found it helpful to think about how it could be applied in the world.

So the first idea is to use it for cabinet doors.

The gel material on the sides of the cabinet makes it quieter when it slams shut, and the magnets pull the cabinet closer together.

Imagine putting the same material on the bottom of your sneaker.

This way, you can go to a container store and buy a sheet of metal to hang behind your door or in your closet so you can literally put your shoes upright without a shelf.

For me, I really like this idea.

(Laughter) If you come to my apartment and look at my closet, you'll understand why. It's messed up.

KS: After looking at the unexpected properties and then looking at some applications, you can see why this is important and what the possibilities are.

But I've found that the way you express your ideas makes a big difference.

ZK: It was six months ago when Keith and I were in Los Angeles having coffee with Roman Coppola at Starbucks.

He primarily produces music videos and commercials for his company, The Directors Bureau.

As we talked, Roman told us that he was something of an inventor on the side.

And we were showing him the same gel magnet that you have in your hand - and you know, we shared the same thoughts. And it showed on his face. Roman began to get very excited and took out this manila folder. He opened it up, Keith and I peeked in, and he started showing us the concept he was working on.

These things really excite him. So we were looking at these concepts and we were like, 'Wow, this guy is good.

Because his way of presenting the concept, his approach, was completely different from ours. He sold it to you as if it were for sale now.

We thought as we were driving back to the airport. Why is this so powerful?

Upon further consideration, I realized that I could enter all the details about the experience as if I had seen it on TV. So at TED, we decided to take our favorite idea about gel magnets and work with Roman and the team at the Director's Bureau to create a commercial for the product of the future.

Narrator: Need speed?

In Inventables Water Adventures, you will be challenged to ride a magnetic levitation board down a waterslide so fast and so high that the brakes will stop when you reach the bottom.

Aqua Rocket: Coming this summer.

KS: Well, we showed the concept to some people the other day, and they asked us, "When will it come out?"

So, I want to let you all know that it's not actually going to be released, it's just a concept.

ZK: So when envisioning these concepts it's important to make sure they work from a technical point of view.

So I'd like to briefly explain how this works.

This is the magnetic levitation board that appeared in the commercial.

The gel you have lined the bottom of the board.

This is important for two reasons.

The first is that the soft nature of the magnet prevents injury if it hits the rider's head.

Additionally, the bottom of the slide will be an electromagnet, as you can see from the picture on the right.

So this actually pushes the rider back a bit when descending.

Its repulsive force, plus the power of falling water, will make this slide go faster than any slide on the market.

For this reason, a magnetic braking system is required.

Once you get to the bottom of the slide -- (laughter) -- you pass through an aluminum tube.

And let Keith explain why it's important from a technical standpoint.

KS: Engineers know that although aluminum is a metal, it is not a magnetic material. But when you drop a magnet into an aluminum tube, something unexpected happens.

So I set up a simple experiment here to demonstrate it.

(Laughter) You can see the magnet slowly falling.

I'm not going to get into the physics of that here, but all you need to know is that the faster the magnet falls, the greater the stopping force.

ZK: Well, our next tech is actually a 10 foot pole and I have it in my pocket.

(Laughter) There are several different versions.

(laughter) KS: Some of them unfold automatically like this.

It can also be rolled up automatically or stabilized like a rucksack to hold any position in between.

ZK: When we were talking to Bender to see how these could be applied or how they are currently being applied, he told us that the military uses this and soldiers keep this on their chests, very concealed, and set it up as an antenna to clearly send the signal to the base when out in the field.

In our brainstorming, we came up with the idea that it can be used as a soccer goal. So when the game is over, just roll up the goal and put it in your gym bag.

(laughter) KS: Now the interesting thing about this is that you don't have to be an engineer to understand why a 10 foot pole that fits in your pocket is so interesting.

(Laughter) So we decided to go out on the streets of Chicago and ask a few people on the street what they thought they could do with it.

Man: I use it to clean ceiling fans and remove cobwebs from my house. I do it that way.

Woman: I want to make my own walking stick.

Woman: Build a ladder to climb the tree.

Woman: It's an olive server.

Man: An extension pole of sorts -- the kind that painters use.

Woman: When you dive deep, you can catch fish quickly and roll them up to make a spear that makes them easier to swim in... well.

(laughter) ZK: Now, for the next technology, we're going to do a little demonstration, so we need volunteers from the audience.

Teacher, please go up.

(Laughter) Come on, go up. Tell everyone your name

Steve Jurvetson: Steve.

ZK: Steve. All right, Steve, come on, follow me.

Stand in front of the TED billboard.

right there. That is wonderful.

And hold onto this. with effort.

(laughs) KS: No, not yet.

(laughs) ZK: I just wanted to let everyone know that this presentation was provided by Target.

KS: Hey -- it's perfect, just perfect.

Well, Zack, I'll show you a water gun battle from the future.

(laughter) So come on, come forward. got it. So if you look here -- no, no, it's fine.

So, explain the temperature of the shirt to your audience. please.

SJ: It's cold.

KS: Well, the reason it's cold is because it's a dry liquid developed by 3M, not the actual water in the squirt gun.

It is completely transparent, odorless and colorless.

It's very safe, so it's okay to drink this.

(Laughter) And the reason it feels cold is because it evaporates 25 times faster than water.

(Laughter) Okay, thanks for coming.

(laughter) ZK: Wait, wait, Stephen -- I put some dry liquid in this before we left. Because you can shoot your friends during breaks.

SJ: Great, thank you.

KS: Thank you for coming. Let's give him a big round of applause.

(Applause) So what does this dry liquid mean?

An early version of Fluid was actually used on the Cray supercomputer.

Now, what was unexpected about this was that Zach was able to stand on stage and soak a completely innocent audience with absolutely no worries about scratching electronics, getting him wet, or scratching a book or computer. It works because it is non-conductive.

As you can see here, you can immerse the entire circuit board in this and no damage will occur.

It can be circulated to release heat.

Today, however, it is most widely used as a fire extinguishing fluid in office building sprinkler systems.

Again, completely safe for humans. The fire will go out and nothing will hurt.

But our favorite idea was using it at a basketball game. So rain can pour down on the players during halftime, cooling everyone down and drying up in minutes. It will not harm the court.

ZK: Our next technology comes from a Japanese company called Sekisui Chemical. One of the company's R&D engineers was working on ways to make the plastic harder.

As he did so, he realized something unexpected.

I will show you the video.

KS: As you can see, I didn't rebound. Well, this was an unexpected side effect of some experiments they were doing.

Technically, it is called "shape retention".

Now let's think about the relationship with aluminum foil.

Shape retention is common in metals. Bend the aluminum foil and it will hold its position. Compare this to a plastic trash can. Pushing in the sides will always bounce.

ZK: For example, you can make a watch that wraps around your wrist without a buckle.

For that matter, if you knit together something like a little basket, you can create a shape-retaining sheet and embed it in the fabric. That way you can make a picnic sheet to wrap around the table. That way the table won't be blown away on windy days.

The next technology is ink, so it is difficult to observe unexpected properties by itself.

So I prepared a video showing how to apply it on paper.

KS: As this paper bends, the resistance of the ink changes.

So simple electronics can be used to detect how much the page is bent.

Now, to think about this possibility, think of business cards, the back of cereal boxes, board games, or anywhere ink is supplied. Everywhere you use ink, you can change the way you interact with it.

ZK: So my favorite idea is to ink the book.

This could completely change the way we interface with paper.

You can see black lines on the sides and top. When you turn the pages of a book, the book actually detects what page you are on based on the curvature of the page.

Plus, you can program the book to actually email the text on the notes page by folding one of the corners.

KS: For the last technology, we worked again with Roman and his team at the Director's Office to develop a futuristic commercial that explains how it works.

Old Milk Carton: Oh yeah, it smells good.

who are you?

New milk carton: I am the new milk.

OMC: I used to smell like you too.

Narrator: Fresh Watch from Inventables Dairy Farms.

A package that changes color when the milk runs out.

Don't let milk ruin your morning.

ZK: Well, this technology was developed by two professors at the University of Illinois, Ken Suslick and Neil Lacoe.

KS: Well, how it works is there's a matrix of color dyes.

And these dyes change color in response to odors.

A vanilla scent could turn the left 4 brown and the right 1 yellow. This matrix can generate thousands of different color combinations to represent thousands of different odors.

But if you know what odor you want to detect, like in a milk commercial, you can formulate a specific dye to detect just that odor.

ZK: Yes. That sparked a conversation between Professor Suslik and me, where he explained what this could do beyond simply detecting spoiled food. That's where the importance lies.

His company actually conducted a survey of firefighters across the country to find out how they currently test the air when responding to emergencies.

And he comically explained that firefighters sometimes say, they looked around. If it wasn't for the police officer who died, it would have been fine to go.

(Laughter) So this is a true story. They use police officers as canaries.

(Laughter) But on a more serious note, they decided they could develop a device that could smell better than humans and could determine whether it was safe for firefighters.

In addition, he spun off a company called ChemSensing from the same university and is working on the development of medical devices.

So a patient can come in and actually breathe into their own device.

The dots change as they detect specific bacteria, viruses, and even lung cancer odors, and software can be used to analyze the results.

This could fundamentally improve the way doctors diagnose patients.

Now they use a trial-and-error method, which could potentially tell them exactly what kind of disease they have.

KS: So those are the six that I'm sharing with you today, but do you see why we find them so appealing?

Because each of these six have changed our understanding of what is possible in the world. Before seeing this, we would have thought: A 10 foot pole won't fit in your pocket. Cheap stuff like ink can't sense how the paper bends. All these things we are always trying to find out.

ZK: This is something Keith and I really enjoy doing.

As you can see by now, it was actually only yesterday that I remembered why. I was talking to Steve Jurvetson downstairs by the escalator. And he said that when Chris sent that little box, one of the items in it was hydrophobic sand, that is, sand that doesn't get wet. He was playing with his son.

And you know, his son was crazy. for he had dipped it in water and taken it out, and it was completely dry. A few weeks later, he said, his son was playing with his mother's locks of hair and noticed water droplets on his hair.

And he picked it up, looked up at Steve, and said, "Look, it's a hydrophobic string."

(Laughter.) So, hearing that story, that really summed it up for me.

thank you very much.

KS: Thank you.

(applause)

this is very strange to me. Because I'm not used to doing things like this. I always stand on the other side of the light and now I feel the pressure I put on others. And it's hard...

I think the previous speaker provided a very good backdrop for the impulses behind my work, what drives me, and my sense of loss and my attempts to find answers to the big questions.

But this, for me, I mean, coming here to do this, I have my favorite sculptor, Giacometti, who lived in France for many years, studied, you know, studied and worked, and then came home and was asked, "What did you make?"

What did you do after years apart?

And he showed some figures.

And apparently they said, "Is this what you've been doing for years?"

And we expected a masterpiece! ”

But what struck me was the realization that in those little works, a man's life, his quests, his thoughts, the culmination of everything, was just a scaled-down version.

In a way, I feel like that.

I feel like I'm coming home to talk about being away for 20 years.

And I'll start by briefly describing what I've seen so far. A few movies, not much, two feature films and a few short films.

So let's go with the first part.

(Video) Woman: "I will destroy life," said my mother.

i love her

She's not even my real mother.

My real mother and father abandoned me and returned to Nigeria.

The devil is in me, court.

Court: Go to sleep.

Woman: Have you been there?

Court: Where?

Woman: Nigeria.

Court: Never.

My mother wanted one, but I couldn't afford it.

Woman: I wish I could.

I have a feeling that I will be happy there.

Why are you guys kicking me out?

Court: I don't want to kick you out.

Woman: You don't need me.

You are too blind to see it now.

Boy: What are you doing all day?

Marcus: I read it.

Boy: Aren't you bored?

Then why are there no jobs?

Marcus: I'm retired.

Boy: So?

Marcus: So I've done my part for the Queen and the country, and now I'm working for myself.

Boy: No, I've been sitting like an idiot all day now.

Marcus: Is it because you're doing what you love?

Boy: Come on, read a book and don't let anyone eat it.

In particular, it does not promote marijuana habits.

Marcus: It nourishes my heart and soul.

Boy: Arguing with you is a waste of time, Marcus.

Marcus: You're a rapper, right?

Boy: Yes.

Marcus: A modern poet.

Boy: Yes, you can say that.

Marcus: So what are you talking about?

Boy: What does that mean?

Marcus: It's simple. What do you rap about?

Boy: It's real, dude.

Marcus: Whose Reality?

Boy: My fucking reality.

Marcus: Tell me about your reality.

BOYS: Racism, oppression, life doesn't give people like me a break.

Marcus: So what solution do you offer? I mean, the poet's job is more than just -- Boy: Man, fight power! It's simple. Blow the bastards out of the sky.

Marcus: With an AK-47?

Boy: Oh, if I had one, yes.

Marcus: So how many soldiers have you assembled to fight this war together?

Boy: Oh, Marcus, you know what I mean.

Marcus: When a man resorts to profanity, it's a sure sign that he can't express himself.

Boy: Look, you're just pissing me off right now.

Marcus: Panthers.

Boy: Panther?

The ass kickers who got sick of white supremacy and power bullshit and went in there and kicked everyone's ass.

It's fucking evil, dude. I saw a movie. bad! what?

Director 1: I saw his last movie.

Exhaust, right?

Woman 1: Yes.

D1: No joke, but really epuise.

Epuise -- Tired, exhausted, fed up.

Director 2: Can't you just shut up?

Now, you speak bluntly to me, what is wrong with my film?

Alright, let's go.

W1: It's terrible.

Woman 2: Worst? what about your case?

What, what, what, what, what?

What do you think of your movie?

D1: My movie is fine.

Better than making a documentary that no one has ever seen.

What are you talking about?

Have you ever traveled from Hollywood to shoot a real movie?

you put people to sleep

Dream about bullshit.

(Applause) Newton Aduaka: Thank you. The first clip completely tries to capture what cinema is to me and where I come from when it comes to cinema.

The first piece is actually a young woman talking about Nigeria and saying she feels happy there.

This is the feeling of a person away from home.

That's what I experienced, and I still do.

I haven't been home for a while now, about five years.

I was away for a total of 20 years.

And it's really, really sudden, you know, this was made in 1997, the time of Abacha. Military dictatorship, the history of Nigeria, the worst part of this post-colonial history.

So this girl having these dreams is just a way for us to maintain a sense of what home is.

It can be kind of romantic, but I think it's beautiful. Because, especially in a society where we feel alienated, we need something to hold on to.

That brings us to the next part. There, a young man talks about the lack of opportunities: living as a black man in Europe, the glass ceiling that everyone knows and everyone talks about, and his reality.

Again, this was my story, this was me talking, this was also the age of multiculturalism in England, and there was this buzzword, and it was trying to say, what exactly does this multiculturalism mean in people's real lives?

And what would a child, a child like Jamie — a boy — think with all this anger that had built up inside him?

What will it be?

Of course, what happens there is violence. You see it when you talk about the ghetto, or when you talk about South Central Los Angeles and this sort of thing, but ultimately when it's channeled it evolves as a riot and emerges as a riot. It was like the riots in France two years ago where I live and everyone was shocked. Because everyone thought, "Oh, France is a liberal society."

But I lived in England for 18 years.

I've been living in France for about 4 years and actually living in France feels like going back 20 years.

And the third one. The third question for me is, "What is cinema to you?" What do you do with movies?

A young Hollywood director is talking with his friends, the filmmakers, about the meaning of cinema.

I think that leads to my final work, what cinema means to me.

My life began in 1966, a few months before the Biafran War. The Biafran War lasted three years, and there were three years of war.

All of that, that whole childhood echoes and takes me to the next piece.

(Video) Voice: Onicha, I'm going to school with my brother.

Onicha: Yes, mother.

Commander: Soldiers, the battle is about to begin, and you must prepare to die.

You definitely need to get -- ?

Boy Soldier: Ready to die, willing to die.

C: Successful. Change is only coming from the muzzle.

CS: It's the barrel of a gun!

C: This is the gun.

CS: This is the gun.

C: This is an AK-47 rifle. this is your life

this is your life This is... this is your life.

Ezra: They give us a special medicine. We call it foam.

amphetamine.

Soldiers: When the rain comes, when the sun comes, the soldiers will soon leave.

I say that the rain will come, the sun will come, the soldiers will leave.

We went from one village to another - three villages.

I don't remember how I got there.

Witness: We walked for two days.

we didn't eat.

There was no food, just a little rice.

Without food, I was sick.

The injections made us feel better.

God will forgive us.

He knows things we didn't know. I did not know!

Chairman: Do you remember January 6th, 1999?

Ezra: I don't remember.

Various voices: I'm going to die! you will die! (shouting) Onitha: Ezra! (Ezra: Onitha! Onitha!) Various voices: ♫ No more trouble needed ♫ ♫ No more trouble needed ♫ They killed my mother.

Mende's bastard sons.

(screaming) Who is she?

myself.

why are you giving me these?

So stop staring at me

My story is a little complicated.

I'm interested.

Mariam is pregnant.

do you know who you are? crocodile.

big mouth. I have short legs.

To Rufus, you are Ezra the coward.

He doesn't look after his army.

Troops, pay your last honor. salute.

Open your eyes, Ezra.

A blind person sees the diamond finally fit in his pocket.

♫ No more hassle ♫ Get that idiot out!

Think you're preparing for a massive attack?

This place must be a mine.

your girl is here

well done, well done

That's what you're here for, right?

Are you going back to fighting?

♫ No more troubles ♫ ♫ No more troubles ♫ ♫ No more troubles ♫ ♫ No more troubles. ♫ Wake up! Please wake up everyone. Road block!

♫ We don't need any more... ♫ Chairman: We hope that, with the help of you and others, this Commission will greatly contribute to understanding the causes of the War of Rebellion.

More than that, a healing process must be initiated and ultimately completed in order to put an end to this terrible period in the history of this nation.

beginning of hope.

Ezra Guelefn, please stand up.

Please state your name and age on your commission.

Ezra: My name is Ezra Gelefn.

I am 15 or 16 years old. I don't remember.

Ask my sister, she's a witch, she knows everything.

(Sister: 16 years old.) CC: Mr. Gelefn, let me remind you that you are not here on trial for a crime you have committed.

E: We were fighting for freedom.

If killing in war is a crime, every soldier in the world must be prosecuted.

War is a crime, but I didn't start it.

Are you a retired general too?

CC: Yes, that's right.

E: Then you have to go to court, too.

Our government was corrupt.

Lack of education was a means of controlling their power.

May I ask, do you pay school fees in your country?

CC: No, it's not.

E: You are richer than us.

But we pay the school fees.

Your country talks about democracy, but you support corrupt governments like mine.

why? Because you want our diamonds.

Ask if anyone in this room has ever seen a real diamond.

no.

CC: Mr. Gelefn, just to be clear, you are not on trial here today.

you are not on trial.

E: Then let me go.

CC: You can't do that, son.

E: So you're a liar.

(Applause) NA: Thank you. What I really want to say here is that while we're making all these great strides, what we're doing, for me, you know, I think we should, Africa needs to move forward, but we have to remember and we need to make sure we don't come back here again.

thank you.

Emeka Okafor: Thank you, Newton.

(Applause.) One of the themes that comes through very strongly in the film we just saw is the sense of psychological trauma that young people have to play the roles of child soldiers.

And considering where you're coming from and the extent to which it's not taken as seriously as it should be, what do you have to say about it?

NA: During the course of my research, I actually spent some time in Sierra Leone researching this.

And I remember meeting many child soldiers, ex-combatants, child soldiers as they like to be called.

I met a psychosocial worker who works with them.

I have met psychiatrists, aid workers, NGOs and many others who have spent time with them.

But on the flight home from my last trip, I remember breaking down in tears thinking to myself that if any child in the West, in the Western world, had a similar day, they would be in therapy for the rest of their lives.

So for me, the idea is that we have this many children, this is a generation, we have children of a whole generation, but they have gone through so much trauma and damage and Africa has to live with that.

But what I mean is, take into account all this great progress, all this great achievement declaration.

That's really my thought.

EO: Well, thank you for coming to the TED stage.

It was a very moving piece.

NA: Thank you.

EO: Thank you.

(applause)

I believe that the future of this planet depends on humans, not technology. And we already have the knowledge. We are kind of in the final stages when it comes to knowledge.

However, we are not yet at the final stage when it comes to our perception.

We are still one foot in the dark ages.

And hearing some of the presentations here, and hearing the extraordinary range of human capabilities, our understanding, and contrasting that with the fact that we still call this planet "Earth," it's pretty extraordinary -- we're stepping one foot into the Dark Ages.

Quickly, Aristotle, what he meant was "unflat, stupid, round."

Galileo--he had the Inquisition, so he needed to be a little more polite--his words were, "You're not in the middle, you see."

And Hawks said, "It's not the Earth, you idiot, it's the ocean."

This is an ocean planet.

T.S. Eliot really said that for me. This should give you goosebumps. "We never stop exploring, and the end of our exploration is returning to where we started and knowing the place for the first time."

And the next line is, "Through an unknown and memorable gate, where the end of the earth was discovered is the beginning."

So I have a message for you.

It seems to me that we are all heading in the wrong direction.

To the rocket pushers in the audience: I love what you do, I admire your bravery, your bravery. But your rocket is pointing in the wrong direction.

(Laughter.) And it's all a matter of perspective.

Let me tell you--I don't mean to insult you, but hey, if it were me--and I'm not serious about this. because it would be an insult. So pretend and soften the blow--tell what you're thinking.

Suppose I hold up a 1 foot by 1 foot square that is the color of the earth, and another square that is 2 square meters at the base, or 1.5 times as large, and is the color of the ocean. And I said, what is the relative value of these two things?

Well, it's relative importance.

You would say -- yes, yes, yes, we all know this. Water covers twice the area of ​​the earth as dry land.

But it's a matter of perception, and if you think so, when I say "this is an oceanic planet foolishly called 'Earth'", if you think so, it's relative importance, two to one, you're ten times wrong.

Well, you're not as thick as two short boards, but that's what it sounds like when you say "earth." Because if I were to face the demonstration, the surface of the earth would be paper thin.

It is a two-dimensional existence in the form of a thin membrane.

The expression of the sea has depth.

And if you focus on those two things, you might find that their relative scale is 20 to 1.

It turns out that over 94 percent of life on Earth is aquatic.

It means that we earthlings are in the minority.

The problem we have with believing it is that we have to just let go of the idea that this earth was created for us.

Because that's the problem we have.

If this is an oceanic planet and we have very few of this planet, it will only interfere with much of mankind's thinking.

have understood. Please allow me to criticize this.

I'm not talking about James Cameron. Of course you can, but I don't.

Check out his latest film, Alien of the Deep. It's unbelievable.

There are two of these deep rovers in this piece, but I can criticize them because these great ones are mine.

I think this represents one of the most beautiful classic submarines ever built.

If you look at that submarine, you see a sphere.

This is an acrylic sphere.

It creates all the buoyancy and all the payload of the aircraft, and the battery hangs down here, just like a balloon.

This is the envelope, this is the gondola, the payload.

These giant lights are also taken up for criticism later.

And it actually has two great manipulators.

In fact, this is a submarine with very good features. That's what it was designed for.

The problem with this is that the reason I never build something like it again is that it's a product of two-dimensional thinking.

It is us humans going into the sea as engineers. We have all the hang-ups on the ground, all the constraints, and importantly, these two-dimensional constraints that we have that are so constrained that we can't even understand them, but we're bringing them into the water.

I noticed Jim Cameron sitting in the seat.

The seat works in a 2D world and gravity blows onto it.

And in a two-dimensional world, we know about three dimensions, but we don't use it. Because it takes so much energy to go up against gravity.

And mothers tell us, "Be careful not to fall." because it will fall.

Now let's enter the real atmosphere of this planet.

The inner atmosphere of this planet is water. That's the atmosphere inside it. It has two atmospheres. One is the outer gaseous atmosphere and the other is the lighter atmosphere.

Most of life on Earth is in its inner atmosphere.

And that life enjoys a third-dimensional existence that is alien to us.

Fish don't sit.

(Laughter.) Not at all. Their mothers don't tell little baby fish to "be careful not to fall".

You won't fall. won't fall

They live in a 3D world and there is no difference in energy whether you go there or go there or go there or go there.

It's just a three dimensional space.

And we are just beginning to understand it.

I don't know of any other submersibles or even remote locations that make use of the fact that this is a three-dimensional space.

This is the way we should enter the sea.

This is a three dimensional machine.

What we should do is to dive into the sea and move in this three-dimensional space while the animals are free.

Ok, this is good.

This is the first attempt by humans to fly underwater.

Now I am approaching this gorgeous big giant manta ray.

She has wings twice as big as mine.

There I come she is looking at me

And notice how she rolls and turns. She sits there trying to blow air into the tank and just rolls over instead of going up or down.

And the spacecraft I'm working on has never been public before.

Chris asked us to show him something that hadn't been shown before.

I wanted you to notice that she actually turned around and tried to stand up.

There I am I see her come back and approach me.

Insert a reverse thrust and try to pull it down slowly.

I try to do everything carefully.

We spent about 3 hours together and she is starting to trust me.

And this ballet is controlled by the women here.

She gets that close and then leaves.

So now I'm trying to follow her, but I'm practicing flying.

This is the first flying machine. This was the first prototype.

This was fly-by-wire. It has wings.

No ridiculous buoyancy tanks. Buoyancy is guaranteed permanently.

And you can gain control of it by moving through the water.

Well, look at it. Look, it's -- she surprised me.

She immediately rolled over from the bottom.

As a matter of fact, this is the only time I've actually dived with this machine.

It took 10 years to build.

But this woman here has taught me, uh, so much.

We learned so much during our three hours in the water.

I had to build another machine.

But look here. Instead of blowing out the tank and slowly resurfacing thoughtlessly, there is a little back pressure and the sub comes straight back out of the water.

This is Sony's built-in camera. Thank you Sony.

It's not that ugly, but it's distorted because the camera is too close.

Well, she'll be right over head.

This is a wide angle camera.

She's just inches above my head.

"Oh, oh, oh, he just crossed over my head, oh, I don't know, but he was so close."

I will be back, not for the air.

“What an amazing encounter with a manta ray. I am speechless.

We are only a few feet apart. Now go back down. ”

Now, can I cut it? Please put the lights back on.

(Applause.) We flew and tried to catch up with the animal, but it wasn't our lack of mobility.

It was the fact that she was going so slowly.

In fact, I designed it to move faster through the water. That's because we thought it was necessary for us to move fast and secure range.

But after that encounter, I really wanted to go back and dance with that animal.

she wanted to dance

So what we needed to do was increase the wing area to increase the grip and allow for higher power output.

So here is the submarine that was outside last year.

Here you can see that the wing area has increased.

Also, obviously, it was such a powerful thing that I wanted to bring others with me, but I didn't know how.

So we opened the world's first flight school.

The rationale for the world's first flight school is as follows. When the Coast Guard came up to me and said, "When we were diving in this little sphere, they left us alone, but when we started flying around in our underwater jet fighters, they got a little nervous - they would come up and say, 'Do you have a license for that?'

Then he puts on sunglasses, grows a beard, and says, "I don't need a smelly license."

(Laughter) "I'm writing this stinking license", I am.

Bob Gelfond is here, but someone in the audience here has license number 20.

They are one of the first underwater aviators.

We have run two flight schools there.

I don't know where it's going, but it's a lot of fun.

What happens after 30 seconds? I can't tell you.

But for the underwater flight patent, Karen and I were looking into it, and some business partners wanted us to patent it, but we weren't sure about it.

we decided to let it go.

It seems wrong to try to patent the freedom of underwater flight -- (Applause) --

So if you want to imitate us and join us, please join us.

Another is the much lower cost.

We have developed another technology called spider optics, which Craig Bentner asked me to present here this morning. We plan to build a beautiful, tiny, tiny version of this - unmanned, ultra-deep water - for his boat to go retrieve deep-sea DNA material.

(Applause.) Thank you.

Good mood.

I'm Sophie.

okay don't worry, everything will be fine.

(Laughter) There are people on the balcony who are very happy to be there.

(Laughter) So this is Sophie -- it's not Sophia -- no, it's Sophie.

She has a French name.

why do you think?

(Laughter.) So for most people, Sophie is just fear incarnate.

She has too long legs, too hairy and too big to believe.

But to me, Sophie is a great feat of bioengineering.

As you know, Sophie is a testament to all living things that have survived from time immemorial. All animals that have succeeded in producing offspring for generations to this day.

As you know, over a billion years ago, the first primitive cells began to evolve on this planet.

It took spiders 430 million years to become what they are today. One of the most versatile, most diverse, and most evolved groups on this planet (laughter).

Giving a speech while wrestling with a tarantula is really sporty.

(Laughter.) So we must remember that Sophie, and indeed all of us, are witnesses to all the ruthless battles that all our forefathers, all our forefathers, have indeed and consistently won.

In fact, all of us, and each of you, is actually a continuous billion-year success story.

And in Sophie's eyes, that success is partly due to what's in her chest, just below her eyes.

There she has a pair of poison glands attached to a pair of tusks, which are folded into her mouth.

I mean, without its fangs and poison, Sophie would never have survived.

Many animals today have evolved venom systems to survive.

Today, every kind of venomous snake, every kind of spider, and every kind of scorpion has its own venom signature, made up of dozens, if not hundreds, of chemical compounds, so to speak.

And all of these compounds have evolved purely for one purpose: incapacitating and ultimately killing.

Well, poison actually works in different ways.

Believe me, Venom can make you feel pain like you've never felt before.

The poison can stop the heart within minutes or turn the blood into a jelly.

Poison can also paralyze you almost instantly, or eat away at your flesh like acid.

Now, I know these are all pretty gruesome stories, but to me, it's like music to my ears.

that's what i love.

Why?

Well, it's not because I'm crazy, no.

(Laughter) Imagine what we could do if we could collect all of these super-strong compounds and use them to our advantage.

That's awesome, right?

I don't know, but what if we could use these poisons to make new antibiotics?

What if you could actually help people suffering from diabetes and high blood pressure?

In fact, all these applications are already being developed all over the world by the same scientists as me.

As you know, hypertension is actually regularly treated with drugs developed from toxins produced by the South American copperhead.

In fact, a toxin produced by lizards in North America can be used to monitor patients with type 2 diabetes.

And hospitals around the world are developing new protocols for using marine snail toxins as anesthetics.

As you know, poisons are like a huge library of compounds available to us, produced by hundreds of thousands of living things.

And -- oh sorry, she just wants to go for a walk.

(Laughter) In fact, spiders alone are thought to produce more than 10 million compounds with potential therapeutic applications.

Ten million.

And do you know how many scientists have actually succeeded in their research so far?

About 0.01 percent.

That means there are still 99.99 percent of completely unknown compounds out there waiting to be picked and tested. This is great.

As you know, until now scientists have focused their research on very charismatic and very dangerous animals, namely chain and cobra, scorpion and black widow spider.

But what about those little bugs that are actually all around us?

Like the spider that lives behind the sofa?

Who freaks out by deciding to shoot through the floor while watching TV?

Oh, you have that at home too.

(Laughter) Well, what about those guys?

In fact, do they also produce some kind of amazing compound in their tiny bodies?

Well, a few months ago the honest answer would have been "I have no clue".

But now that my students and myself have started working on it, I can say that they are actually producing very interesting compounds.

I'll talk more about that later, but first, I want to talk more about this "under consideration."

How do we find out?

Well, first the students and I have to catch a lot of spiders.

So how do we do that?

Well you will be amazed.

If you start looking, you will find many spiders.

They live practically everywhere around us.

Within a few hours, you could probably catch 200, 300, 400 spiders, bring them back to your lab, and house each in a separate home.

Then give each of them a little bit of food.

So I know what you're thinking: "This guy is crazy.

He runs Spider B&B at work..."

(Laughter) No, no, it's not exactly and it's not the kind of venture I would recommend you start.

No, when you're done with that, wait a few days and then anesthetize those spiders.

Once they are asleep, we run a small electrical current through their bodies, which deflates their poisonous pleasures.

Then look under a microscope and you'll see tiny tiny droplets of poison appearing.

So, we use a capillary tube, a glass tube as thin as a hair, to collect the tiny droplets.

Then we catch the spider and bring it home and start again with another spider.

The spider is completely unharmed in the process, so after a few days it can release a little venom again, recover, and then be released back into the wild.

It takes literally hundreds of spiders to produce the equivalent of a raindrop of venom.

Therefore, that drop is very precious to us.

And once we have it, we freeze it and send it to a machine that separates and purifies all the compounds in that venom.

We are talking about trace amounts.

Actually, we're talking about ten millionths of a liter of a compound, but you can dilute that compound thousands of times with that volume of water and test it against cancer cells, bacteria, and all sorts of other nasties.

And this is when a very exciting part of my work begins, because this is a pure scientific gamble.

It's like "Las Vegas, baby" to me.

(Laughter) We spend so many hours, so many resources, so many hours preparing these compounds, and then we test them.

And most of the time nothing happens.

There is nothing.

Occasionally, however, certain compounds are obtained that have truly surprising effects.

That's the jackpot.

When you say that, you actually have to take something else out of your pocket - be afraid, be very afraid.

(Laughter) Now, in that little tube, there's actually a very normal spider.

It can be found in toilets, the kind of spiders found in sheds, basements, and sewers.

Well, that little spider happens to produce a surprisingly powerful antibacterial compound.

It can even kill the drug-resistant bacteria that often make headlines and cause us so much trouble.

To be honest, if I lived in your sewer pipes, I'd make antibiotics too.

(Laughter.) But that little spider may actually hold the answer to a very serious concern we have.

Worldwide, about 1,700 people die every day from antibiotic-resistant infections.

Multiply this by 365 and you arrive at a staggering 700,000 deaths each year. Because antibiotics that worked 30, 20, 10 years ago can't kill these very common bugs.

The reality is that the world is running out of antibiotics, and the pharmaceutical industry doesn't have the answers, really the weapons, to address that concern.

Thirty years ago it was thought that 10 to 15 new antibiotics would hit the market every few years.

Do you know how many of them have hit the market in the last five years?

two.

The reality is that if things continue as they are, it will be decades before we are completely helpless against infectious diseases, just as we were before the discovery of penicillin 90 years ago.

In reality, we are fighting an invisible enemy that adapts and evolves much faster than we do.

And in that war, this little spider could become one of our greatest secret weapons.

Even a 10,000-fold dilution of just 1/500,000 of a liter of venom is enough to kill most bacteria that are resistant to other types of antibiotics.

Really great.

Every time I repeat this experiment, I just wonder: how is that possible?

How many other possibilities and secrets do the brothers actually have?

What great products can you find if you really look for them?

So when people ask me, "Are insects really the future of medicine?"

My answer was, "Well, I really believe they have some important answers."

And we really need to give ourselves the means to investigate them.

So when I get home late tonight, I see that spider in the corner of my room...

(laughs) Please don't crush it.

(Laughter.) Just look at it, admire it, and remember that it's a truly wonderful creature, a pure product of evolution, and that perhaps that spider will one day have the answers and be the key to your own survival.

See, she's not that important anymore, right?

(laughs) Thank you.

(applause)

For your son's 6th birthday, you promised him the cutest creature in the world - the one he hugged.

It's hard to believe it's the cousin of the Dreadful Dudley or the Dreadful Fadley.

They are all members of the Wuddly species and the process of adopting them is very unique.

It takes 100 eggs to make one Wadley animal.

If you put 100 eggs inside an incubator, they will fuse and join together like this:

Combining blue and purple makes a red egg.

Combining red and blue makes a purple egg, and combining red and purple makes a blue egg.

The most abundant eggs are paired first, and if two piles are evenly numbered, one of them will spawn a random egg.

Keep combining until you have one left.

If the last egg is blue, it will hatch a Cadry.

Purple eggs give Dudley and red eggs give Fadley.

The incubator now contains 99 eggs.

23 are blue, 33 are purple and 43 are red.

Adding an egg of any color to the room can start the process of egg fusion.

When all the eggs combine into one egg, the hatched creature will bond with you at first sight. That's why it's so important to get your hands on a cadry.

After all, you made a promise to your son.

What color eggs should I add to the incubator to have cute babies?

Pause the video and find out for yourself.

Please answer with 3. Please answer with 2. Please answer with 1. It is easy to confuse them with cute, cuddly and fluffy eggs, which come from different colored eggs.

If you ignore the total number of eggs of each color and observe only the process of egg fusion, you might notice something that simplifies this problem.

When two eggs fuse, the number of eggs of each color is reduced by one and the number of eggs of the third color is increased by one.

That is, all parities, i.e. even and odd, are changed at the same time.

All three piles are odd at the moment, but if you add an egg to one color, that color will be even and the other two will be odd.

No matter what color you choose, the parity of the other two mountains will always be opposite. The parity of each pile flips at the same time each time the egg fuses, so if it's even, it's odd, and if it's odd, it's even.

We want to end up with 1 blue, 0 purple and 0 red eggs, i.e. odd, even and even.

That is, the pile of blue eggs must also initially be the opposite parity of the other two piles.

So if you add a blue egg to the room, only 1 blue egg will remain after the 99 eggs fuse.

A hatched Cudry will make your 6-year-old the happiest.

However, please follow the owner's advice and never feed after midnight.

In 2012, a team of Japanese and Danish researchers set a world record for transmitting one petabit of data (equivalent to 10,000 hours of high-definition video) in one second over a 50-kilometer cable.

This was more than just a cable.

It is an improved version of fiber optics, the hidden network that connects the globe and makes the Internet possible.

For decades, long-distance communications between cities and countries have been carried out by electrical signals on copper wires.

It was slow and inefficient, with metal wires limiting data speeds and power wasted as wasted heat.

But in the late 20th century, engineers learned to communicate much better.

Instead of metal, glass can be carefully melted down to create flexible strands of fiber hundreds of kilometers long and no thicker than a human hair.

And instead of electricity, these chains carry pulses of light that represent digital data.

But how does light travel through glass rather than through it?

The trick lies in a phenomenon known as total internal reflection.

Since the days of Isaac Newton, lens makers and scientists have known that light bends as it passes between air and materials such as water and glass.

When a light ray inside the glass hits the surface at a steep angle, it is refracted or bent as it goes out into the air.

However, if a ray of light travels at a shallow angle, it bends too much and remains trapped, bouncing around in the glass.

Under the right conditions, something that is normally transparent to light can instead hide it from the world.

Compared to electricity and radio, fiber optic signals experience very little degradation over long distances. A small amount of power will scatter and the fiber cannot be bent too sharply or light will leak out.

Today, a single fiber optic carries many wavelengths of light, each carrying a different data channel.

And fiber optic cables contain hundreds of strands of these fibers.

More than a million kilometers of cables crisscross the ocean floor and connect continents. That's enough to orbit the equator nearly 30 times.

The use of fiber optics almost eliminated data limitations due to distance, allowing the Internet to evolve into a computer on earth.

Our mobile work and play increasingly relies on massive, overloaded computer servers housed in massive data centers scattered around the world.

This is called cloud computing, and it leads to two big problems: heat waste and bandwidth demand.

The majority of Internet traffic travels to and from data centers, where thousands of servers are connected by traditional electrical cables.

Half of the running power is wasted as heat.

Meanwhile, the demand for wireless bandwidth is steadily increasing, and gigahertz signals used by mobile devices are reaching their limits for data delivery.

Fiber is too good on its own, fueling hopes for overly ambitious cloud and mobile computing.

But a related technology, integrated photonics, came to the rescue.

Light can be guided not only by optical fibers, but also by very thin silicon wires.

Silicon wires do not guide light as well as fibers.

But with them, engineers can shrink every device in a 100-kilometer fiber-optic network to a tiny photonic chip that connects to a server and converts electrical signals to light and vice versa.

These electrical-to-lighting chips enable power-efficient fiber to replace wasteful electrical cables in data centers.

Photonic chips can also help break through wireless bandwidth limitations.

Researchers are working to replace mobile gigahertz signals with terahertz frequencies to transmit data thousands of times faster.

But these are short-range signals. It can be absorbed by moisture in the air or blocked by tall buildings.

Terahertz signals can be relayed over long distances by distributing tiny wireless-to-fiber optical transmission chips throughout a city.

It achieves this through a stable middleman, optical fiber, for lightning-fast wireless connectivity.

Throughout human history, light has provided us with vision and heat, and has served as a steady companion as we explore and settle in the physical world.

Today, we are adding information to light, redirecting it to run along fiber optic superhighways, with various integrated photonic exits, and building even more vast virtual worlds.

18 minutes is a pretty tight time limit, so I'm going to hit it off right before I make it work.

please. I'm going to talk about five different things.

I will talk about why it is desirable to overcome aging.

Talk about why we have to solve the problem. Actually, we will talk about this in a little more detail than we do.

Of course, we also talk about feasibility.

Talk about why we are so fatalistic about doing things about aging.

And maybe the second half of the talk is going to be about how you can actually prove fatalism wrong, by actually doing something about it.

Do it in two steps.

I will first talk about how to go from relatively modest lifespan extension (defined as 30 years for people who are already middle-aged at the start) to truly age-defying levels.

So essentially eliminating the connection between your age and your chances of dying next year or getting sick in the first place.

And, of course, the last thing I'm going to talk about is how to get to that intermediate stage, the point of maybe 30 years of life extension.

So let's start with why you should.

Now, I would like to ask you a question.

Hands up: Does anyone in the audience agree with malaria?

It was easy. OK.

OK. Hands up: Is there anyone in the audience who doesn't know if malaria is a good thing or a bad thing?

OK. So we all think malaria is bad.

I thought that would be the answer, so that's very good news.

Now, I would like to say that the main reason why we think malaria is bad is because of the common characteristics of malaria with aging.

And this is its peculiarity.

The only real difference is that far more people die from aging than from malaria.

Now, I like to talk to audiences, especially in the UK, about comparisons to fox hunting. Fox hunting was banned by the government just a few months ago after a long struggle.

I mean, I know I'm here with a sympathetic audience, but you know, a lot of people aren't entirely convinced by this logic.

And it seems to me that this is actually a pretty good comparison.

You know, a lot of people have said, "Well, city kids don't have to tell us country folk how to spend their time.

It is part of the traditional way of life and we should be allowed to continue with it.

It's environmentally sound. It will stop the fox population explosion. ”

But in the end the government won, as the majority of the British public, and certainly the majority of MPs, came to the conclusion that this was not really acceptable in a civilized society.

And I believe that human aging has all these characteristics in common.

What part of this do people not understand?

Of course it's not just about life -- (laughter) -- it's about healthy living, you know -- whether dying is fun or not, being weak and miserable and dependent isn't fun.

Really, this is how I would like to describe it.

It's a global trance.

These are the kind of incredible excuses people have for aging.

That's not to say that these excuses aren't worth it at all.

A few good points should be made here and what we should be thinking about, planning ahead so things can go wrong so that we can minimize confusion when it comes to actually figuring out how to fix aging.

But when I actually recall my sense of proportion, these things are completely crazy.

You know, these are arguments. These are legitimate concerns.

But the question is whether the risks of doing something about aging outweigh the downsides of doing the opposite: leaving it unattended.

Are these serious enough to outweigh the unnecessary premature deaths of 100,000 people a day?

Well, if you don't have such a strong argument, don't waste my time, what I'm saying.

(Laughter) Well, there's one argument that some people really think is strong, and that's right here.

People worry about overpopulation. They say, "If we solve the aging problem, there will be fewer deaths to speak of, or at least far fewer deaths, than careless crossings of St Giles.

Therefore, we will not be able to have many children and children are really important to most people. ”

That's true.

And as you know, a lot of people try to cover up this question and give answers like this:

I disagree with those answers. I think it basically doesn't work.

I think it is true that we face a dilemma in this regard.

We need to decide between lower birth rates and higher mortality rates.

Of course, simply refusing these treatments in favor of continuing to have many children would result in high mortality.

And I say okay, the future of humanity has the right to make that choice.

The bad news is that we make that choice for the future.

If we hesitate, hesitate, and never actually develop these treatments, we are blaming the entire population. Such people would have been young and healthy enough to benefit from the treatment, but it is not because we did not develop it as soon as possible. We are denying them an indefinite lifespan, which I consider immoral.

That's my answer to the overpopulation question.

right. So the next question is, why should we be a little more proactive about this?

And the fundamental answer is that accelerated aging trance isn't as dumb as it seems.

It's actually a smart way to deal with inevitable aging.

Aging is scary, but it is inevitable. So we have to find a way to get it out of our heads. And it makes sense to do whatever you want to do for it.

For example, making up ridiculous reasons why aging is actually a good thing after all.

But of course this only works if you have both of these components.

And as soon as that inevitability becomes a little unclear, and perhaps within the realm of what we can do about aging, this becomes part of the problem.

This aging-promoting trance state stops us from getting excited about these things.

That's why we really want to talk and advertise and say quite a lot about this to get people's attention and to make them aware that they are in a trance in this regard.

That's all I have to say about it.

Now let's talk about feasibility.

And I think the underlying reason why we feel aging is inevitable boils down to the definition of aging I give here.

A very simple definition.

Aging is a side effect of being alive in the first place, that is, metabolism.

This is not a completely tautological statement. That's a reasonable statement.

Aging is basically a process that happens to inanimate objects like cars, and even though we have a lot of smart self-repair mechanisms, those self-repair mechanisms aren't perfect, so it happens to us too.

So basically, metabolism, defined as everything that keeps us alive from one day to the next, has side effects.

Those side effects accumulate and eventually cause medical conditions.

that's a good definition. In other words, we can say it like this. That is, we can say that there is such a sequence of events.

And according to most people, there are actually two games when it comes to postponing aging.

They are what I call here the 'gerontological approach' and the 'gerontological approach'.

Geriatricians intervene late in the day when the condition is becoming apparent, trying to hold back the sands of time and stop the accumulation of side effects from causing the condition immediately.

Of course, this is a very short-term strategy. It's a losing battle, as the causative agents of medical conditions become more and more abundant over time.

As you know, prevention is better than cure, so the gerontological approach looks much more promising on the surface.

Unfortunately, we don't understand metabolism very well.

Unfortunately, we don't really understand how living things work. Even cells are still poorly understood.

Things like RNA interference, for example, were discovered only a few years ago, and are a very fundamental component of how cells work.

Basically, gerontology is a good approach in the end, but it is not the approach of its time when talking about interventions.

So what do we do about it?

I mean, that's great logic, and it sounds pretty convincing, pretty ironclad, right?

But it's not.

Before I explain why it's not, a little bit about what's called Step 2.

Suppose, as I said earlier, that we acquire the ability to give people who are already middle-aged, say 55, an additional 30 years of healthy life expectancy. Let's do so today for discussion.

I'll call it "Powerful Human Rejuvenation". OK.

How long does that mean people of various ages today, or similarly, people of various ages when these treatments come along, will actually live?

To answer that question, you might think it's easy, but it's not.

You can't just say, "If you're young enough to benefit from these treatments, you'll live 30 years longer."

that's the wrong answer.

And the reason it's the wrong answer is for progress.

There are actually two types of technological advances for this purpose.

We have big fundamental breakthroughs and we're going to improve those breakthroughs step by step.

Now, in terms of the predictability of the timeframe, the two are very different.

Radical breakthroughs: It is very difficult to predict how long it will take to achieve radical breakthroughs.

We decided a long time ago that flying would be fun, and it took us until 1903 to actually figure out how to do it.

But after that, the situation stabilized and became more or less even.

I think this is a reasonable sequence of events in the evolution of powered flight technology.

In fact, each product can be considered beyond the imagination of the inventor of the previous product.

Incremental progress piled up to create something that was no longer incremental.

This is what we see after a radical breakthrough.

And it's seen in all kinds of technology.

Computers: You can see almost parallel timelines, but of course they happen a little later.

See medical. So sanitation, vaccines, antibiotics, that is, similar timeframes.

So actually, I don't think Step 2, which I called a step earlier, is a step at all.

In fact, people young enough to benefit from these first treatments that provide this modest life extension, even if they were already middle-aged when the treatments appeared, would have reached a certain apex.

Most of them live an extra 30 or even 50 years with improved treatment.

In other words, they will have the upper hand in the game.

Treatments will improve faster than the remaining imperfections in them catch up with us.

This is a very important point for me.

Because when most people hear me predict that many people alive today will live to be over 1,000 years old, they think I'm saying that within the next few decades we'll invent treatments that will eradicate aging so that we can live to be over 1,000 years old.

I didn't say that at all.

My point is that the improvement rate for those treatments is good enough.

We'll never be perfect, but we can solve the problem of 200-year-olds dying before 200-year-olds die.

Same for 300, 400, etc.

I decided to give this a little name: "Longevity Escape Velocity".

(Laughter) Well, I think you got the point.

So these trajectories here basically tell us how people are expected to live, in terms of life expectancy as measured by health status, at a given age at the time these treatments arrive.

If you're already 100, or 80, and even an average 80, you probably can't do much with these remedies. Because you're too close to death's door for the first experimental treatment to be effective enough.

you won't be able to stand them.

But if you're still 50, you might be able to get out of diving. Then, as you know (laughter), you will eventually get over this situation and start to become biologically younger in a meaningful way in terms of your physical and mental youthfulness and age-related mortality risk.

And of course, if you're a little younger than that, you'll never be vulnerable to death from age-related causes.

This is the real conclusion I got. I don't know how old the first 150-year-old is now. Because we don't know how long it will be before we get first-generation treatments.

But regardless of that age, I would argue that the first person to live to 1,000--possibly a global catastrophe--is in fact probably only 10 years younger than the first 150.

It is quite possible.

Now, finally, let's spend the rest of the talk, the last seven and a half minutes, on Step 1. I mean, how do we actually achieve a modest lifespan extension that allows us to achieve escape velocity?

For that, we need to talk a little bit about mice.

I have milestones that correspond to the robust rejuvenation of humanity.

I call this "strong mouse rejuvenation", but it's not very imaginative.

And this is it.

When I say using long-lived mice, I basically mean mice that live an average of about 3 years.

We don't do anything to them at all until they are already two years old.

And we give them different treatments, and with those treatments, they live to their fifth birthday on average.

That is, from the time you start treatment, add 2 years and triple your remaining lifespan.

So the question is, what does that actually mean in the time frame to reach the milestones for humanity we talked about earlier?

As we have discussed, we can equate this to robust rejuvenation or longevity escape velocity in humans.

Second, what does the public perception of how long it takes to get to those things once you get a mouse mean?

And third, the question is, how much do people actually want it?

The first question is a purely biological question and seems very difficult to answer.

One has to be very speculative, but many of my colleagues would say that you shouldn't make such guesses, and that you should continue to advise until you know more.

I say it's nonsense.

I would say it would be totally irresponsible to keep quiet about this.

You have to make your best guess about timeframes to give a sense of proportion so people can assess their priorities.

Therefore, I would say that the chances of reaching this RHR milestone of robust human rejuvenation are 50/50 within 15 years of reaching robust rejuvenation in mice.

15 years since the sturdy mouse.

Perhaps public perception is somewhat better than that.

The public tends to underestimate how difficult scientific matters can be.

So they probably think it's five years away.

They may be wrong, but it really doesn't matter that much.

And finally, of course, I think it's fair to say that a large part of the reason why people have such mixed feelings about aging today is the global trance I mentioned earlier, coping strategies.

At this point it will be history. Because aging has been delayed so effectively in mice, it is no longer possible to believe that human aging is inevitable.

So in the end there is likely to be a very big change in people's attitudes, and of course it will have a very big impact.

Now, to explain how we get these mice, I'd like to add a little bit to the aging discussion.

I will use this term "damage" to refer to intermediate things that are metabolically induced and ultimately cause pathologies.

Because the important thing about this is that the damage itself is caused continuously throughout our lives, even before we are born, even if the damage only ultimately causes a medical condition.

But it's not part of the metabolism itself.

And I found this helpful.

Because this way you can redraw the original figure.

Fundamentally, the difference between gerontology and geriatrics is that gerontology seeks to slow down the rate at which metabolism produces this damage.

And I'll explain what damage looks like in concrete biological terms right away.

And geriatricians are trying to stem the sands of time by stopping injuries from turning into pathologies.

And it's a losing battle because the damage continues to accumulate.

Thinking this way, there is a third approach.

It can be called an "engineering approach", but I would argue that an engineering approach is within reach.

An engineering approach does not intervene in any process.

We will not intervene in this process or this process.

That's a good thing because it means it's not a losing battle, and it's not about improving with evolution, so it's within the limits of what it can do.

The engineering approach simply says, "Let's repair all of these different types of damage on a regular basis. Not necessarily completely, but significantly enough to keep the level of damage below the threshold that needs to exist to cause virulence."

We know this threshold exists because we don't develop age-related diseases until middle age, despite the damage that has accumulated since before we were born.

Why do we say we are within range? Well, it's basically this.

The point on this slide is actually the bottom.

We'll be here all night trying to say which metabolism is important for aging. Because basically all metabolism is important to aging in some way.

This list is for illustration only. it is incomplete.

The list on the right is also incomplete.

This is a list of types of age-related pathologies and is only an incomplete list.

But I want to make a point to you guys that this middle list is actually complete. Here is a list of the types of things that are considered damaging, metabolic side effects that ultimately cause or can cause a medical condition.

And they are only seven.

Of course they are categories of things, but there are only 7 of them.

Cell loss, chromosomal mutations, mitochondrial mutations, etc.

First of all, I would like to explain why this list was completed.

Of course you can have a biological argument.

Some will say, "Okay, what are we made of?"

We are made up of what lies between our cells.

What can damage accumulate?

The answer is "long-lived molecules". This is because even if a short-lived molecule is damaged, once that molecule is destroyed (such as when a protein is destroyed by proteolysis), the damage disappears.

It must be a long-lived molecule.

So all seven of these things have been discussed in gerontology a long time ago, which is pretty good news. So biology has come a long way in the last 20 years, so the fact that we haven't expanded on this list is a pretty good indication that there isn't much to expand on.

But better than that. We actually know in principle how to fix all this with the mouse. In principle, we could probably implement these fixes in practice in 10 years.

Some of them are already partially implemented and the one at the top is already partially implemented.

I don't have time to go over them at all, but my conclusion is that if we could actually get the right funding for this we could probably develop strong mouse rejuvenation in just 10 years, but we need to get serious about it.

You really have to start trying.

Of course, there are some biologists in the audience, so I'd like to answer some questions you might have.

You may be dissatisfied with this story, but basically you should go read this content.

I have published a lot on this. I cite the experimental studies that underpinned my optimism, and they are quite detailed.

The details are why I'm so confident in the fairly aggressive time frame that I'm projecting here.

So if you think I'm wrong, you better go find out why you think I'm wrong.

And of course it's important not to trust people who call themselves gerontologists. Because, as with any radical departure from conventional thinking in a particular field, it is to be expected that the mainstream will show some resistance and not take it seriously.

So you really have to do your homework to understand if this is true.

I will end by saying a few things.

One is that, in the next session, when a man said a little while ago that he could decode the human genome in half the time, everyone said, "Well, it's clearly not possible."

And you know what happened.

So this actually happens.

We have different strategies. There is the Methuselah Mouse Award. It's basically an incentive to innovate and do what you think might work, with a cash prize if you win.

There is actually a proposal to set up a research institute.

This costs a little money.

But I mean, how long will it take to spend that money on the Iraq war?

not very long. OK.

(Laughter) Profit distracts biotech, so it has to be a philanthropy, but basically I think there's a 90% chance of success with this.

And I think we know how to do it. I'll stop with that.

thank you.

(Applause) Chris Anderson: Okay. I'm not sure if you have any questions, but I thought I'd give people a chance.

Audience: You are talking about aging and trying to overcome it, so why make yourself look like an old man?

(laughs) AG: I'm an old man. Actually, I am 158 years old.

(Laughter) (Applause) AUDIENCE: Species on this planet have evolved with immune systems to fight all disease. As a result, individuals were able to live long enough to produce offspring.

However, as far as I know, all species have evolved to actually die, and when cells divide, telomerase shortens and eventually the species perishes.

So why does evolution seem to have chosen immortality when immortality would be an advantage, or is evolution simply imperfect?

AG: Great. Thank you for asking a question that can be answered with an uncontroversial answer.

I'll give you a bona fide mainstream answer to your question, which I happen to agree with. No, aging is not a product of selection or evolution. [Aging] is simply the product of evolutionary neglect.

In other words, we age because it takes a lot of effort not to age. Aging more slowly requires more genetic pathways, requires more sophisticated genes, and that remains true the longer you push it out.

So unless evolution doesn't matter, and you don't care whether genes are passed on by individuals, live longer, or are passed on by breeding, there is some regulation in it, which is why different species have different lifespans, which is why immortal species don't exist.

CA: Genes don't care, but do we care?

AG: That's right.

Audience: Hello. I read somewhere that in the last 20 years the life expectancy of basically everyone on the planet has increased by 10 years.

Project that and you'd think you could live to be 120 if you didn't crash on your bike.

Does that mean that I am also one of the subjects who will become a thousand years old?

AG: If I lose a little weight.

(Laughter) Your numbers are a little off.

A typical figure is that life expectancy is increasing at a rate of one to two years per decade.

So it's not as good as you think or expect.

But I plan to move it up to 1 year ASAP.

Audience: I heard that many of the brain cells we have as adults are actually in human fetuses, and that brain cells live for about 80 years.

If that's really true, is there an impact in the world of biological rejuvenation?

What if there are cells in my body that live for 80 years instead of the typical few months?

AG: There are certainly technical implications.

Basically all we have to do is replace cells, especially neurons, in some areas of the brain that lose cells at a significant rate, but we don't want to replace cells any faster than that. Or because replacing it too early can lead to cognitive decline.

It was a bit of an oversimplification when I said earlier that there are no species that do not age.

Some species (such as Hydra) do not have senescence, but they achieve senescence by having no nervous system and practically no tissues that depend on very long-lived cells for function.

It was located in an area called Wellawatta, a prime residential area in Colombo.

We were standing on a railroad track that ran between a friend's house and the beach.

Normally, the tracks would be about eight feet above the waterline, but by that time the water level had receded to a level three to four feet below normal.

I had never seen coral reefs here.

Fish were caught in rock pools left behind after the water receded.

Some children jumped and ran to the rock pool with their bags.

They were trying to catch fish.

No one realized this was such a bad idea.

People on the tracks just kept watching.

I turned around to check my friend's house.

At that time, someone on the track shouted.

Before I could turn around, everyone on the track was screaming and running.

The water was starting to come back. Bubbles were rising on the coral reef.

The children managed to run back to the tracks.

No one got lost there. But the water level continued to rise.

It reached the height of the track in about two minutes and was about to cross the track. At this point, I had run about 100 meters.

continued to rise.

I saw an old man, knee-deep in water, standing at the gate, refusing to move.

He said he would spend the rest of his life there by the beach and would rather die there than run away.

The boy was separated from his mother and ran home to get the dog, which was clearly frightened.

The old woman was crying as her son drove her out of the house.

The slums built on railroad reservations between the sea and the tracks were completely swept away.

Police had warned residents that it was a dangerous place, but no one was there when the water rose.

But they didn't have time to evacuate their belongings.

For the next few hours, the sea was strewn with pieces of wood for miles. These were all from slum houses.

When the water receded, it was as if it never existed.

It may be hard to believe unless you read a lot of news reports, but in many places villagers were still terrified after the tsunami.

When the once-calm sea ruthlessly swallows people, homes, and long-tail boats without warning, and no one can give you reliable information about whether the next sea is coming, you don't want to settle down either.

One of the most frightening things about tsunamis that hasn't been mentioned before is the complete lack of information.

This may seem like a small thing, but it's scary to hear rumor after rumor of another tidal wave coming at exactly 1pm, or maybe tonight, or maybe another tidal wave, bigger than the last one.

I don't even know if it's safe to go back to sea to catch the boat to the hospital.

I think Phi Phi Hospital was destroyed.

The boat will likely go to a hospital in Phuket, but if it's too dangerous to land at the pier, it will probably go to the safer Krabi instead.

I don't think another wave is coming any time soon.

At Phi Phi Hill Resort, I was stuck in the farthest corner from the TV, but I listened for information.

They reported that there was a magnitude 8.5 earthquake in Sumatra, which triggered a massive tsunami.

This news has given us some solace in understanding what has just happened to us.

However, the report focused on what had already happened and provided no information on what to expect going forward.

In general, it's all just hearsay and rumours, and in the 36+ hours I've spoken to none of them knew anything for sure.

These are basically two accounts about the Asian tsunami from two internet blogs that were set up after the tsunami.

Below are two videos of the tsunami that have also been posted on the blog.

Be warned, they are very powerful.

One was from Thailand and the second was also from Phuket.

(shouting) VOICE 1: Come in. I'll come back later.

Voice 2: "Are you coming again?"

VOICE 1: Right. I'll come back later.

VOICE 2: Come on in.

VOICE 1: Here we are again. Voice 2: New wave?

VOICE 1: Here we are again. New wave!

[unintelligible] (shouting) They called me here.

James Slowitzki: Hmm. They were both on this site, waveofdestruction.org.

The world of blogging will have a before and after tsunami. Because one of the things that happened after the tsunami was that in the beginning, on the first day, there was a lack of some sort of live report or live video, and some people complained about this.

They said, "Broster let us down."

What has become very clear is that within a few days an enormous amount of information leaked out, giving us a complete and powerful picture of what happened in a way that we could never have before.

And what you had was an essentially unorganized, unconnected group of writers, vloggers, etc., able to come up with a collective portrait of the disaster that gave us a much better sense of what it was like to actually be there than the mainstream media could provide us.

So, in a way, you can think of Tsunami as a kind of original moment, a moment when the blogosphere matured to some degree.

Now, I'm going to move from this traditional sense of the sublime, the awe-inspiring, the terrifying, to something a little more mundane.

Because when I think about blogging, I think that for most people who are interested in blogging, the main concerns are politics, technology, etc.

In the remaining 10 minutes of this talk, I'd like to ask you three questions about the blogosphere.

First, what do we know about our ideas and what motivates people to do things?

Second, do blogs really have the potential to access some kind of collective intelligence that has remained largely untapped so far?

And the third part is the potential problem, what is the dark side of blogging as we know it?

OK, first question. What can they tell you about why people do things?

One of the interesting things about the blogosphere specifically, and of course the internet in general, which may seem like a pretty obvious point, but I think it's an important one to think about, is that the people who generate these vast amounts of content every day, who spend a ton of time organizing, linking, and commenting on what's on the internet, are doing it largely for free.

They get nothing but attention and some reputational capital for doing a good job.

And this is—at least for traditional economists—somewhat noteworthy. For the traditional account of the economist basically says that people do things for concrete rewards, primarily economic rewards.

But instead, what we've discovered on the Internet, and one of the great geniuses of the Internet, is that people have found ways to work together without spending any money at all.

They kind of came up with a different way to organize their activities.

Yale Law Professor Yochai Benkler, in his essay "Coase's Penguin," argues that the open-source model you're familiar with from Linux can be applied in many different situations.

And if you think about it in terms of the tsunami, they're essentially an army of local journalists, producing vast amounts of material for no other reason than to tell their story.

It's a very powerful idea and a very powerful reality.

And this is what offers very interesting possibilities for organizing various activities in the future.

So I think the first thing the blogosphere tells us is that we need to expand our idea of ​​what is rational, and that we need to expand the simple equation of value equals money, or that you have to pay to be good, but that you can actually collectively create really great products without changing your money at all.

There are a few bloggers out there who are actually making money in some way (probably in their 20s or so now), and a few bloggers who are actually trying to make a full-time living out of it, but the vast majority of them are blogging because they like blogging, they like being in the spotlight, or whatever it is.

Howard Rheingold has written a lot about this, and I think he will write more about it, but the concept of spontaneous cooperation is incredibly powerful and worth considering.

The second question is what does the blogosphere actually do for us in terms of accessing collective intelligence?

As Chris said, I wrote a book called "The Wisdom of Crowds."

And the premise of "wisdom of crowds" is that under the right conditions, groups can be surprisingly intelligent.

And they are actually often smarter than the smartest of them all.

The simplest example of this is when you ask a group of people to do something like guess how many jelly beans are in a jar.

If I had a jar of jelly beans and asked people to guess how many jelly beans were in the jar, the average guess would be surprisingly accurate.

It's probably somewhere within 3-5 percent of the number of beans in the jar, better than 90-95 percent.

One or two of you may be good at guessing the jelly bean, but most of the time the whole group guesses better than everyone else.

And what's interesting is that we can see this phenomenon at work in many more complex situations.

For example, looking at a horse's odds at a racetrack is a near-perfect prediction of that horse's chances of winning.

In a way, the winning group on the racetrack is probabilistically predicting the future.

Think of something like Google, which basically relies on the collective intelligence of the web to find the sites that contain the most valuable information. I know Google does a very good job of that. We can do that because this chaotic thing we collectively call the "World Wide Web" actually has amazing order, or amazing intelligence.

And I think this is one of the real promises of the blogosphere.

Dan Gilmore, whose book We the Media is included in the gift pack, said that as a writer he recognizes that readers know more than he does.

And this is a very challenging idea. This is a very challenging idea for mainstream media. This is a very challenging idea for someone who has invested an enormous amount of time and expertise and invested a lot of energy into the idea that they know themselves better than others.

But what the blogosphere offers is the possibility of having a collective decentralized intelligence that we know is there and available if we just find a way to access it.

Each blog post, each blog comment, by itself may not be exactly what we're looking for, but the collective judgment of the people posting and linking to it often gives a very interesting and very valuable picture of what's going on.

So that's the positive side.

This is the positive side of what is sometimes called participatory journalism or citizen journalism. In fact, we are giving voice to people who were previously unable to speak, giving access to information that has always existed but was essentially underutilized.

But there is a dark side to this, and that is what I want to spend the last part of my talk on.

One of the things that happens when you spend a lot of time on the Internet, and a lot of time thinking about it, is that it's easy to become addicted to it.

It's very easy to get carried away with the internet's decentralized bottom-up structure.

It's very easy to think that networks are necessarily good, that being linked from one place to another, being closely linked within a group, is a very good thing.

And most of the time it does.

But there is also a downside to this, and indeed a kind of dark side. That is, the more closely we are connected to each other, the harder it is for each of us to remain independent.

One of the fundamental characteristics of networks is that once users are linked to the network, the network begins to shape their views and interactions with other users.

This is one of the things that defines what a network is.

A network is not just a product of its constituent parts.

It's more than that.

As Stephen Johnson said, it's a new phenomenon.

This has the following advantages: It is very beneficial in terms of efficiency of information transfer. It gives you access to many people. This allows people to coordinate their activities in a very good way.

But the problem is that groups are only wise if the people in them are as independent as possible.

This is the paradox of the wisdom of crowds, or the paradox of collective intelligence, that what it requires is really a form of independent thinking.

And networks draw attention to what they value, making it difficult for people to do that.

One of the very obvious phenomena in the blogosphere is that once a meme or idea is in motion, people easily pile on it, because other people have links to it, for example.

People link to it, and others link to it, and so on.

And the piling up of existing links is a phenomenon that is so characteristic of the blogosphere, especially the political blogosphere, that it essentially undermines this beautifully distributed bottom-up intelligence that blogs can exhibit under the right conditions.

My favorite metaphor is that of the circular factory.

A lot of people talk about ants.

As you know, this is a conference inspired by nature.

The ant colony becomes a classic trope when talking about bottom-up decentralized phenomena. Because while individual ants don't know what they're doing, collectively they can make incredibly smart decisions.

They can reach food as efficiently as possible and can direct traffic at amazing speeds.

So the ant colony is a good model. All these small parts come together to form the big one.

But we know that ants sometimes go astray. And if army ants are walking around and get lost, they start following simple rules. In other words, just do what the ant in front of you does.

And what happens is that the ants end up inside the circle.

And in this famous example, 1,200 feet long and lasting two days, the ants continued to march in circles until they died.

And I think that's kind of a cautionary thing.

That's what we should be afraid of. We will keep marching on until we die.

Now I would like to return to the topic of the tsunami. Because one of the great things about the tsunami is that it really represented a true bottom-up phenomenon, not in terms of the tsunami itself, but in terms of blogosphere coverage.

We saw sites that didn't exist until they got a ton of traffic.

You've seen people be able to offer their own perspectives in ways never before possible.

There, we could really see the intelligence of the web manifest itself.

That's the advantage. Circular mill is a drawback.

And I think it's the former that we really need to work on.

thank you very much. (applause)

My name is Dennis Frohman. "Accent".

My mom grips the accent like a shotgun with both hands.

Her tongue, the brass joint that slides between her lips, her hips, it's all the sound of laughter and the wind.

She speaks Spanish and English Sanchocho, pushes each other, lashes out, can't tell my mama 'quiet', my mama doesn't know 'quiet'.

Her voice is a turn better and you shouldn't tell her to be quiet. She waited too many years for her voice to be heard and was told that she needed home upkeep.

With the English sitting in her mouth, "strawberry" becomes "er, strawberry", "cookie" becomes "er, cookie", and kitchen, keychain, and chicken all sound the same.

My mama didn't say "yes", she said "ah ha ha" and suddenly the sky became a Hector Laveau song in her mouth.

Her tongue can't lay flat enough to speak English, too many hips, too many bones, too many congas, too many quattros to two-step, too many piano keys between her teeth, too many claves, too many handclaps, too much salsa to sit still, an anxious kid who wants to make Play-Doh in concrete English is too pretty for her kind of finesse.

Her words spill out into conversations between women where hands are all there is, sometimes our hands are all there is, accents that remind us that we're still Bomba, that we're still Plena, when you say "Wepa" the stranger becomes your Hermano, when you say "Dale" the crowd becomes a family reunion.

My mother's tongue is telegrams from my mother adorned with El Campo's coquis, so even if my mother's lips can barely speak English, my mother's accent is a stubborn compass that always points her home.

(Music) (Applause) Thank you for being here.

And since I've been silent for 17 years, I say, "Thank you for being here."

And the first words I spoke were in Washington D.C. on the 20th anniversary of Earth Day.

And my family and friends gathered there to hear my story.

And I said, "Thank you for coming here."

My mother jumped up from the audience and said, "Hallelujah, Johnny is speaking!"

(Laughter) For example, what if you were silent for 17 years and your mother was in the audience?

My father said to me, "That's one." I will explain it.

However, not knowing where his voice was coming from, he turned around.

I hadn't heard my own voice in 17 years, so I turned around and looked and said, "God, who says what I'm thinking?"

Then I realized it was me, and I kind of laughed.

And I could see my father. "Oh, he's really crazy."

Well, I would like to take you on this journey.

And that journey, I believe, is a metaphor for all of our journeys.

It's a little weird, but think about your own journey.

My journey began in 1971 when I witnessed two oil tankers collide under the Golden Gate, spilling 500,000 gallons of oil into the Gulf.

It bothered me so much that I decided to stop riding and driving electric vehicles.

That's a big thing in California.

And in my small community of Point Reyes station in Inverness, CA, it was a big deal. Because there were only about 350 people there during the winter. This is 1971 from now.

So when I came in and started walking, people knew what was going on.

And people would drive up next to me and say, "John, what are you doing?"

And I say, "Yes, I'm walking for the environment."

And they said, 'No, you're walking to make us look bad, aren't you?

You are walking to make us uncomfortable. ”

Maybe it was true. Because I thought that if I started walking, everyone would follow me.

Everyone talked about pollution because of oil.

So I argued, argued, argued with people about it.

I called my parents.

I said, "I don't ride or drive anymore."

My father said, "Why didn't you do that when you were 16?"

(laughs) At that time, I didn't know anything about the environment.

They are back in Philadelphia.

So I said to my mother, "But I'm happy, I'm really happy."

She said, "If you were happy, you wouldn't have to say that."

Mothers are like that.

So, on my 27th birthday, I argued and talked so much that I decided to stop talking and rest for just one day, one day.

And so did I.

I woke up in the morning and said nothing.

And I have to tell you, it was a very moving experience, because I started listening to music for the first time in a long time.

And the story I heard made me feel a little uneasy.

Because I used to listen enough to hear people when I was going to listen and thought I could do it. I knew what they were going to say, so I stopped listening.

And in my mind, while they were still finished, I was rushing over and thinking what to say back.

And I step in.

Well, that's the end of the communication.

So, I actually listened to it on the first day.

And it was very sad for me. Because I realized that I hadn't learned anything in all these years.

I was 27 years old. i thought i knew everything.

I did not do it.

So I decided to do this another day, another day, and another day, and finally promised myself to keep quiet for a year because I started learning more and more and I needed to learn more.

So I said that I would be silent for a year and that on my birthday I would reevaluate what I had learned and maybe talk about it again.

Well, it lasted 17 years.

During those 17 years, I tried to learn about the environment by walking, playing the banjo, drawing, journaling, and reading.

And I decided to go to school. So I did.

I walked down to Ashland, Oregon, where I was giving my degree in Environmental Studies.

Only 500 miles.

And I went to the registrar's office and said, "What, what, what?"

There were newspaper clippings.

"Oh, do you really want to go to school here?"

you don't …?

We have prepared a special program for you. ’ they said.

And in those two years, I graduated with my first degree, a bachelor's degree.

Then my father came out and was very proud.

He said, "Listen, we're really proud of your son, but what are you going to do with your bachelor's degree?

Don't get in the car, don't talk, you have to do that sort of thing. ”

(laughs) I hunched my shoulders and started walking again with my backpack.

I walked all the way to Port Townsend, Washington, built a wooden boat there, rode it across Puget Sound, walked across Washington to Idaho, and walked to Missoula, Montana.

I wrote to the University of Montana two years ago saying I wanted to go to school there.

He said he would come back in about two years.

(Laughter) And there I was. I show up two years later and they really helped me so I tell this story.

Montana has two stories.

The first story is that there was no money. That's a sign I used a lot.

Then they said, "Don't worry about that."

The program director said, "Please come back tomorrow."

He gave me $150 and said, "Sign up for 1 credit.

Are you going to South America? ”

And I said - rivers and lakes, hydrological systems, South America.

So I did.

He came back; he said to me, "Okay, John, you've already registered that one credit, so you've got the keys to your office, and you're enrolled -- you're enrolled, so you can use the library.

And what we try to do is get all the professors to allow you to go to class.

They save your grades and if we find a way to get the rest of the money you can enroll in that class and they will give you grades. ”

Wow, I don't think you do that in grad school.

But I use that story because they really wanted to help me.

They understood that I was really interested in the environment and really wanted to help me along the way.

During that time, I conducted the class without actually speaking.

When I first entered the class, there were 13 students.

I explained to my sign language interpreter friend that I was John Francis, that I had been walking around the world, that I didn't speak anything, and that this was the last time this person would be here to translate.

The students all sat around and gone...

(laughter) I found them checking the schedule to see when they could leave.

They had to take that class with me.

Two weeks later everyone was trying to enter our class.

And I learned in that class - because I do things like this...

Then they all gathered and said, "What is he trying to say?"

"I don't know, but I think he's talking about clearcutting."

"No, no, no, it's not a clear cut, I mean, he's using a handsaw."

"Well, I can't do a clear cut with this..."

"Yes, you can clear cut..."

"No, I think he's talking about selective forestry."

Well, this was a discussion class and we were having a discussion.

I retracted it to keep my fist from flying.

But what I learned was that sometimes when I sign autographs, they say things that I definitely didn't mean, but I should have.

It occurred to me that if you're a teacher and you're teaching, if you're not learning, you're probably not teaching very well.

So I continued.

My father came to see me graduate and I signed the contract and he said, 'We're really proud of your son, but...' You know what happened, he said, 'You have to get in the car and start driving and start talking.

What are you going to do with your master's degree? ”

I dropped my shoulders, backpacked, and went to the University of Wisconsin.

I spent two years there writing articles about oil spills.

No one was interested in oil spills.

But something happened - Exxon Valdez.

And I was the only one in the United States writing about oil spills.

Dad is out again.

He said, "Son, I don't know how you do that, you don't get in the car, you don't talk.

My sister said it might be best to leave you alone because you seem to be doing much better when you don't say anything. ”

(Laughs) Well, I tried carrying a rucksack again.

I put on my banjo, walked to the East Coast, and stepped into the Atlantic Ocean. It took seven years and crossed America in one day.

And that's when I started speaking on Earth Day in 1990, the 20th anniversary of Earth Day.

That's why I said, "Thank you for coming here."

Because it's like a tree in a forest falling down. And if there is no one to listen, does it really make a sound?

And I am grateful to you. I would also like to thank my family for coming to hear my story.

And that is communication.

And they also taught me about listening. It means that you listened to me.

It's one of those things that comes out of the silence of listening to each other.

It's really, really important. We need to listen to each other's opinions.

Well, my journey continues.

My father said, "That's one," but I still didn't let it go.

I served in the Coast Guard and was appointed as a United Nations Goodwill Ambassador.

I wrote the regulations for the US. I mean, I wrote Oil Spill Regulations.

Twenty years ago, if someone had said to me, "John, do you really want to make a difference?"

“Yes, I want to make a difference.”

He said, "Just start walking east. Get out of the car and just start walking east."

And when I walk away for a bit, they say, 'Yes, and you shut up too.'

(laughter) "You're going to make a difference, buddy."

How is that possible?

How can doing something as simple as walking without talking make a difference?

Well, I really enjoyed my time in the Coast Guard.

After that, I worked for only one year, but I said, "Enough, one year is enough."

I sailed on a yacht to the Caribbean, walked all the islands to Venezuela.

And you know, I forgot the most important thing. So I started talking, and I have to tell it.

Since I was studying the environment, I started talking.

I used to study environments at a formal level, but I also had an informal level like this.

And on an informal level, I learned about people and what we do and who we are.

And the environment has changed from just being about trees and birds and endangered species to being about how we treat each other.

Because if we are the environment, all we have to do is look around us and see how we treat ourselves and how we treat each other.

That's the message I received.

And I said, "Well, we have to spread that message."

And I got on a yacht and sailed all the way across the Caribbean. It was actually like working on that boat instead of my yacht. Arrived in Venezuela and started walking.

This is the final part of this story. Because I hadn't been in an electric vehicle yet and this is how I got here.

I was walking through El Dorado, Venezuela. It's a prison town, a famous prison, or an infamous prison. And I don't know what possessed me. Because it didn't look like me here.