The reason this is important is that if you go to Amazon and search for '1984', you can find records not just from the NSA, but from Russian intelligence agencies, Chinese agencies, French agencies, German agencies, Andorran agencies.

It's not encrypted so everyone can see it.

Amazon is the library of the world, but not only are the pages usually unencrypted, but when you search for a book, you don't even have the option to encrypt it in the first place.

This isn't just Amazon, it's something that needs to change.

All companies should enable encryption as the default behavior when users browse the web and don't choose anything.

That way, the privacy and rights of people around the world will be better protected.

(Chris) Edward, can you come over here?

Let's take a look at the next slide. (Applause) This is a program called "Boundless Informant."

Can you please explain?

CA: I think the NSA is -- I think it's aptly named on this one.

It means "infinite informant."

Boundless Informant is a program that the NSA hid from Congress.

The NSA was once questioned in a congressional hearing, and was asked if it could give a rough figure of how many communications it intercepted by Americans.

And the NSA said "impossible."

When I asked them how many communications they were intercepting around the world, they said they couldn't answer because it would be a violation of their privacy.

I appreciate that you think so, but actually when you look at this slide, not only does the NSA already have that ability,

I understand that you are also implementing

The NSA has an internal data format that can track both the recipient and the originator of a communication, and it can immediately tell Congress how much traffic it's holding by looking at the traffic that's coming from the United States.

If you look at the Boundless Informants, you can see that the number of communications intercepted in the United States — by Americans is greater than the number of communications intercepted by Russians in Russia.

I seriously doubt that's what intelligence agencies should be aiming for.

CA: In the Washington Post article based on your data,

"There are thousands of NSA privacy violations a year."

tell me about this

CA: Last year, there was the NSA's testimony to Congress, and for someone like me who's been at the NSA and looked at the internal documents and knows what's written, it was astonishing, because an NSA agent testified under oath that there was no misuse or violation of the bylaws -- I knew this article was going to come out, so I was appalled.

What's particularly interesting about this is that not only was the NSA breaking its own rules thousands of times a year, but some of those 2,776 violations even affected more than 3,000 people at one time.

In another case, all Washington, D.C. calls were accidentally intercepted.

What's surprising about this document, which hasn't received much attention, is that not only was there 2,776 cases of abuse, but Diane Feinstein, chairman of the Senate Intelligence Committee, was unaware of the document's existence until the Washington Post asked her to comment.

So she asked the NSA for the material, and she received it, something she'd never seen before.

This speaks to the state of intelligence oversight in America, where the chairman of the Senate Intelligence Committee had no idea that the rules were being broken thousands of times a year.

CA: So the reaction to this debate is, "Why should I care about that kind of surveillance?

If you haven't done anything wrong, you have nothing to worry about."

What's wrong with this view?

CA: First, you're waiving your rights.

"I'm not going to need that right, and I trust them, so I don't need it. They're going to do the right thing, so it doesn't matter."

Rights are important because you never know when you might need them.

Moreover, this right is part of our cultural identity, not just in America, but in Western societies and in democracies around the world.

We should be able to call our family, we should be able to text people we like, we should be able to buy books online, we should be able to travel by train, we should be able to buy airline tickets.

we have the right to privacy

We should seek warrants based on good reasons and on individual charges. Leaving all of your people's communications in the shadows and unsupervised by anyone or any government is too dangerous to overlook.

CA: Some people are mad at what you've done.

Dick Cheney said recently that Julian Assange was just eaten by a flea, but Edward Snowden is a lion that eats dogs' heads off.

Cheney thinks you committed the worst act of betrayal in American history.

How do you respond to those people?

(Edward) Dick Cheney is exaggerating, isn't he?

(Laughter) (Applause) As always (Laughter) Because when Julian Assange made his biggest reveal, Dick Cheney said that governments around the world would fall, the skies would burn, the seas would boil, and now he says he's eaten by fleas.

We should be skeptical of the hype about this kind of government insider saying it's a matter of national security.

Take a step back, even if they really believe that

They have a narrow view of national security.

The country isn't made safe by privileged people like Dick Cheney.

The public interest and the national interest do not always coincide.

Going to a place where there's no threat, going to war with people who aren't our enemies doesn't make us any safer, whether it's Iraq or the Internet.

the internet is not the enemy

the economy is not the enemy

American companies, Chinese companies, and other companies are all part of our society.

part of a connected world

There's a bond of friendship that binds us all together, and if people all over the world expect us to protect it -- by breaking the code of ethics, the security, the behavior, what if we break that bond ourselves?

CA: You've been accused of "stealing" 1.7 million documents.

So far, it appears that only a few hundred cases have fallen into the hands of journalists.

Does this mean that the revelations will continue?

(Edward) I'm sure it will continue.

I'm sure some of the most important ones will be published in the future.

Chris: Could you come over here, I'd like to ask you about this.

please look

There are a lot of tech people here, and for many of them, this news is probably the most shocking thing they've heard in months.

It's a program called "Bull Run."

Could you please explain?

CA: Bull Run also impresses with the NSA's straightforward naming, but it's named after a battle in the Civil War.

Similarly, "Edge Hill" is named after the British Civil War.

I think the reason they're named like this is because they're targeting their own infrastructure.

Through this program, the NSA deliberately defrauded the companies it worked with.

This is a secure standard — this is a secure standard —

They said they would help you secure your system, but you were actually giving companies bad advice and making their services less secure.

The NSA has planted a backdoor for their own use, but anyone with the time and money to find it can use it to intercept communications.

This is very dangerous, because the distrust of just one security standard, like SSL, which was specifically targeted by Bull Run, makes our entire world less secure.

Whether you want to access your bank or shop online, you'll have to worry about people monitoring and interfering with your communications.

CA: So the decision to install a backdoor could also expose the US to cyberattacks from the outside?

(Edward) That's right.

Since 9/11, there's a dangerous legacy problem that we've seen. The NSA has traditionally played a dual role.

While it has a role in offensive activities, hacking, it also has a defensive role, and traditionally, defense has been more important than offense, based on the perception that America's secrets are more valuable than other nations' secrets.

It's more important for America to prevent China from stealing America's secrets than America hacking a Chinese company and stealing classified information, or hacking a government agency in Berlin and stealing classified information.

By undermining the security of our communications, the NSA is not only endangering the world, it is endangering the very foundations of America, because intellectual property is fundamental to the American economy.

Chris: But they probably calculated that it was worth doing as part of their counter-terrorism efforts.

that it's worth paying that price

CA: If you look at how these programs actually helped stop terrorism, you'll see how unfounded they are. You don't have to take my word for it. The first public court to hear this case has been held in federal court, and I find these programs highly Orwellian and unconstitutional.

Sensing the need and standing to be informed about these things, Congress has drafted legislation to change them. Two independent government commissions that reviewed classified evidence have concluded that these programs have not deterred a single imminent terrorist attack on the United States.

Is this really about stopping terrorism?

Are these programs worth it at all?

I don't think it's worth it, and so does the American judiciary, legislation, and administration.

CA: So you're saying there's a deeper motive to this than the war on terrorism?

(Edward) I'm sorry, I didn't hear you.

CA: Do you think there's a deeper motivation for this than the war on terrorism?

CA: Yeah, we intelligence people tell us that terrorism has always been used as a pretext.

People react emotionally to terrorism, and they are motivated to approve of powers and programs that they would normally not approve of.

Powerful forces like Bull Run and Edge Hill the NSA tried to get hold of in the 1990s

asked the FBI to demand it in Congress

The FBI went to Congress and demanded

Congress and the public refused

It's not worth putting the economy at risk —

Because the social loss is too great for the gain.

But after 9/11, under the guise of counter-terrorism, they began to run these programs in secret, without the approval of Congress or the public. The governments that are plotting behind our backs are the ones we have to protect, because they make us less safe and offer nothing of value.

CA: Can you come over for a minute, I'd like to ask you a personal question.

You're in exile in Russia, and I'm sure many people are frightened by your situation.

You know how Bradley Manning is being treated for leaking US military secrets to WikiLeaks, according to BuzzFeed, some people in the intelligence community want you dead.

what do you think of that?

How do you deal with fear?

CA: No wonder a government wants me dead.

I've said it over and over again, but every morning when I go to bed, I think about what I can do for the American people.

I have no intention of harming the government.

We want to help the government, but when the government ignores all due process and seeks to convict people without a trial, we must stand together as a society and say, "This is not right."

should not threaten the opposition

Nor should journalism be criminalized.

I'm willing to take risks if I can put an end to such things.

CA: Now, I'd like to hear from everyone in the room, because people have very different opinions about Edward Snowden.

I have two opinions

The view that his actions are totally irresponsible and endanger America, and the view that his actions are brave and will in the long run be good for America and the world as a whole.

Please choose one of these two

First of all, how many of you think this is irresponsible behavior?

some hands

it's mentioned

I know it's difficult to raise your hand in front of him, but there are several.

(Edward) I can see it. (Laughter) (Chris) Second person, who do you think is a brave act?

(Applause) (Cheers) There are a lot of people who didn't raise their hands, but I think they're still undecided, because the debate around you isn't as cleanly dichotomous as the traditional policy debate.

It's not about being right or left, pro-government or liberal.

This may partly be a generational issue.

You're a generation that grew up with the Internet, and those generations feel an almost instinctive anger at anything that undermines the Internet.

Can you see it?

(Edward) Exactly.

This is not a question of right or left

It's a matter of the fundamental freedoms that we have. By "we," I mean people all over the world, not just America. This is not a partisan issue.

This freedom is what we all believe in, and it's up to us, all of us who enjoy a free and open internet, to protect it. It's up to us to make sure that this freedom continues for generations to come.

CA: I recently heard a similar claim to yours from the founder of the World Wide Web.

Would you like to come up on stage and let us know what you think? Do you have Tim's mic?

(Applause) Tim welcome.

By the way, what is your opinion? Traitor or hero? I have a guess, but (Tim) I've given you a detailed answer to that question, but if I had to say one thing, you're a hero.

CA: I'm sure you've read about Edward Tim's proposed charter to take back the Internet.

do you think it works?

CA: Yes, of course. My generation didn't just grow up thinking about the Internet, I grew up in the Internet. I never thought I'd be in a position to defend it in such a direct way and become a symbol of it.

I think the internet charter is exactly what we need.

We need to embed our values ​​not just in writing, but in the fabric of the internet.

Chris: Do you have any questions for him?

(Tim) There's two things: a generic one and a— (Chris) Edward, can you hear me?

(Edward) Yeah, I can hear you (Chris) Oh, the picture is back.

(Tim) Maybe the eavesdropper is doing something wrong.

(laughs) (Edward) NSA intervention!

Tim: Looking back at the 25-year history of the web, what do you think is the best we can get from the discussion about the Internet that we want?

(Edward) When it comes to how far we can go, I think the only limit is what we can do.

The Internet that we've enjoyed so far is not only needed in the United States, but by people all over the world, not just technical people, but as you say, ordinary users -- people who contribute through the Internet and social media -- people who check the weather forecast or rely on the Internet as part of their lives.

We will not only have the Internet back as we know it, but we will have a better Internet, a better now, which will not only be better than we could have hoped for, but it will lay the groundwork for a better future than anything we could have imagined.

CA: TED was born 30 years ago in 1984.

Since then, much of the discussion at TED has been that Orwell was wrong.

Rather than having Big Brother watch over us

With the power and transparency of the web, we're going to watch over Big Brother.

Edward's revelation was a stake through the heart of that optimism, but you still think there's a hand, right?

and tim you too

CA: Yes, what we have to argue is that Big Brother is becoming very powerful.

In a recent legal article from Yale University, the Bankston-Soltani principle states that when the cost of government surveillance drops by an order of magnitude, people's expectations of privacy are broken.

But there's a current problem because the government's surveillance capacity has grown by an order of magnitude, but that privacy hasn't been overhauled. But there's hope, because the power of the individual is also being empowered by technology.

I'm living proof of that, because one individual can go head-to-head against the most powerful governments and intelligence agencies in the world, and win. That's why we need to take hope and put that power into the hands of ordinary citizens around the world, not just technical professionals.

Journalism is not a crime Communication is not a crime We should not have our daily activities monitored.

Chris: I don't know how you shake hands. Chris: Shall we use this as a hand?

ED: It's an honor. I can see your wonderful smiles.

(Chris) Tim Thank you very much

(Applause) The New York Times recently asked for your pardon.

If you had the chance to go back to America, would you want to go back?

CA: Yes, of course. Underlying my work is the public interest and the fundamental principles that underlie American and global reporting. If the press says it will, and it has to, it will be a force for debate. But that's not the conclusion.

On the other hand, the government wants to make some kind of deal. If they want to go back to America, they say sell the journalists they worked with.

I did it because it was the right thing to do. I will not stop working for the public good for personal gain.

(Applause) (Chris) Before that day, the Internet and technology brought us back to North America in this way, not in the United States, but in Canada.

Please tell me how are you feeling?

CA: Canada is a lot different than I thought.

always warm

(Laughter) (Chris) TED's mission is to spread valuable ideas.

If you could sum it up in one idea, what is the idea that you think is worth spreading right now?

CA: Last year was the year we all realized that democracy can die in a closed room, but on the other hand, we as individuals are also born in a closed room, and we don't have to give up our privacy to have good government.

Give up your freedom for safety — you don't have to.

I believe that by working together, we can have both open government and a more private life, and I look forward to working with people around the world to make that happen.

thank you very much

(Chris) Edward, thank you.

(applause)

What's the scariest thing you've ever done?

In other words, what's the most dangerous thing you've ever done?

And why did you do that?

I know what the most dangerous thing I've done is, NASA does the math.

For the first five shuttle launches, the odds of a catastrophe happening were one in nine for the first five launches.

When I got on the shuttle, in 1995, even on the 74th flight, if you look back, the odds are 1 in 38, 1 in 35, 1 in 40.

It's not going to be a good minute, and it's going to be an interesting day, because when you wake up in the Kennedy Space Center and you're finally ready to go into space, at the end of the day you'll either be floating gracefully in space or you're going to die.

At the Kennedy Space Center, I enter the spacesuit dressing room, the same room where my childhood heroes put on their spacesuits, the same room where Neil Armstrong and Buzz Aldrin prepared for the Apollo flight to the moon.

So I put on my pressure suit, got into the van, and headed to the launch pad, and this "Astrovan" took me to the launch pad, and I drove through the grounds of the Kennedy Space Center, turned a corner, and in the distance, usually before dawn, I saw the Space Shuttle illuminated by giant xenon lights -- the vehicle that would launch me from Earth.

The crew hold their breath inside the Astrovan and watch it grow as they hold each other's hands.

And then you take the elevator up the tower, and you crawl on your knees, and one by one, you climb into the spacecraft, and you crawl up like caterpillars, and you plummet back into your seat.

When the hatch closes, suddenly the dream of my life, and the dream that seemed impossible at the same time, becomes a reality. The dream I dreamed, the dream I set my heart on when I was nine, suddenly, it's about to become a reality.

In the astronaut world -- the shuttle is a very complex vehicle, the most complex aircraft ever made.

There's a saying among astronauts that any bad problem can get worse.

(Laughter) So I'm very nervous in the cockpit, thinking about what I might have to do, checking every switch and everything.

As the time draws closer and closer, the excitement grows.

About three-and-a-half minutes before launch, the big nozzle on the back, the size of a church bell, rocks back and forth, and it's so huge that the whole plane rocks, as if the plane were wriggling beneath you and an elephant was trying to get up.

Thirty seconds before launch, the craft is fully animated and ready to take off, the auxiliary power unit switches on, the computer begins to function independently, and it is ready to leave Earth.

About 15 seconds before launch, this starts. (Video) Voice: 12, 11, 10 9, 8, 7, 6 -- (Space Shuttle standby for takeoff) -- Start 2, 1 Boosters ignite Space Shuttle Discovery lifts off.

(The space shuttle launches.) Being on board at this time is an incredibly powerful experience.

I feel as if I am in the hands of something much more powerful than I am.

The shaking is so intense that the instruments in front of you look blurry.

It's as if you're being held in the mouth by a giant dog, and its paws are pushing you back into space, pushing you straight up into space, accelerating straight up, shoving your way through the wind, paying attention to the complexity of the situation, and slowly smiling as the shuttle clears each barrier.

Two minutes later, the solid rocket detaches, leaving you with just the liquid engine, hydrogen and oxygen, and you're in a race car and you're hitting the accelerator hard, accelerating like you've never done before.

The weight is getting lighter and lighter, but the force on the body is getting heavier and heavier

It feels like someone is pouring cement on me.

And finally, after about eight minutes and 40 seconds, you're finally at the exact altitude you were aiming for, the perfect speed, the exact direction, where the engine shuts off and you're in weightlessness.

and we live well

really great experience

But why would you take such a risk?

Why are you so dangerous?

For me the answer is very simple

When I was a kid, I wanted to be an astronaut.

When I saw humans walk on the moon for the first time, I naturally wanted to do something about it.

But the real question is how do we overcome the danger and the fear that comes with it? about it

How can we overcome fear and danger?

By having a goal and thinking about what it could lead to, I'm always looking into the details, and this dream has come true: I'm going to fly off to help build the space station, live in this 500-ton structure, orbit the Earth at 5 miles per second, 8 kilometers per second, 16 times a day, and do all sorts of experiments that will help us learn more about what the world is made of, and we'll do 200 experiments on board.

But even more importantly, it allows you to see the world from a new perspective that you would never be able to see in any other way. What spreads out before your eyes is the dazzling splendor of celestial bodies that, if only you had gravity, could hold your mouth open.

Also, at this speed, you experience sunrises and sunsets every 45 seconds for half a year.

And the most epic experience is an outboard spacewalk.

Wearing a spacesuit, which can be called a one-seater spacecraft, you will drift in space with the earth.

It's a whole new perspective, instead of looking up into space, you're floating in space with the Earth.

I hold onto it in one hand and watch the world spin right next to me

Spin silently and watch the colors and textures flow in front of you.

If you look away from that scene, look under your arm, look at everything else, and there's a darkness that's so deep and abyssal it feels like you could sink your hand into it.

The hand that is caught in such a place is a lifeline that connects 7 billion people.

I was on my first spacewalk when my left eye suddenly went blind, and I didn't know why.

I suddenly felt a sharp pain in my left eye and I couldn't open one eye.I don't know why I can't see.

What should I do? I thought

I thought it was good to have two eyes, so I continued working.

Unfortunately, tears don't fall in weightlessness.

The mysterious substance that got into my eye, combined with the tears, formed a larger and larger sphere, and the sphere became so large that surface tension caused it to cross the bridge of my nose and 'thump' into my other eye like a small waterfall.

What's your scariest experience?

(Laughter) It could be a spider.

Many people are afraid of spiders

Spiders are justifiably scary. They're creepy. They have long, hairy legs. This spider is a brown recluse, but it's terrible.

i don't understand

So when a spider comes down, your body will startle reflexively, because spiders are scary.

But you can also think: Will the brown recluse spider sit next to me?

Do you live around here?

In fact, if you do some research, you'll find that there are about 50,000 species of spiders in the world, and only 24 of them are poisonous, and that's the only 50,000 species.

Canadian winters are cold, so here in British Columbia, there are only 720 to 730 species of spiders, and only one of them -- only one -- is a venomous spider, and its venom doesn't kill you, at most it's a terrible bug bite.

And what's more, the spider has very clear markings, and it's almost as if he's saying, "Danger, I'm a venomous spider with the radiation markings on my back."

So with a little bit of caution, you should be able to avoid these venomous spiders, and since they live close to the ground, it's unlikely that you'll walk into a nest where a Black Widow might bite you.

This spider doesn't build that kind of web, it builds it in a corner near the ground.

Black widows are called black widows because females eat males, but they don't prey on humans.

So the next time you run into a cobweb, you don't need panic or any other rudimentary response.

Danger and fear are two different things

So how can we avoid fear?

How can I change my behavior pattern?

First, the next time you see a spider's web, make sure it's not a Black Widow's web, and run into it.

And if you find another spider's web, go towards it again.

It's nothing more than a fluffy thing like a spider's web.

It's no big deal, and any spiders that appear should be harmless, like ladybugs and butterflies.

I guarantee you, if you run into a cobweb 100 times in a row, you'll definitely change some of our most fundamental human behaviors and primitive reflexes. You'll no longer be afraid of cobwebs when walking in the park in the morning, or you'll no longer be afraid to walk into your grandma's attic or your basement.

You can use this technique for anything

If you go blind during a spacewalk, the natural reaction is panic.

anxious and worried

But we practiced all kinds of spider webs (scenarios) with all the poisons (difficulties).

We learned everything there was to know about spacesuits, and we trained thousands of times in the water.

Not only do we practice when things are going well, we also practice when things go wrong all the time, like repeatedly crawling into a spider's web.

And not only in the water, but also in the virtual reality lab, where we wear helmets and gloves and experience near-real conditions.

So when you finally go overboard for a spacewalk, it feels a lot different than going into space unprepared.

And if you go blind, you don't have the natural panic reaction.

Instead, look around you and think, "Scott Parazynski, who is blind but can hear and speak,

I'm with you, so it's fine."

I've even been trained to rescue a crew member who's actually stuck, so he can float me like an airship and push me into an airlock.

You should be able to get back on your own.

no big deal

And if you keep crying for a while, the slimy stuff in your eyes will fade, and your vision will open up again.

When I got back on board after all the spacewalk stuff was done, I realized that Jeff had taken a cotton pad to remove the debris around my eyes, and that it was just an anti-fog thing, and something that looked like an oil and soap mixture had gotten into my eyes.

Now we're using Johnson's ugly type, but we should have been doing that from the beginning. (Laughter) We should have been doing that from the beginning.

What should we really fear?

It's not a vague fear of having a bad feeling

You can fundamentally change how you react to things, and if you can do that, you can go places, see things, experience things, and do things that were previously unthinkable.

Looking out over the hard bed south of the Sahara Desert, New York City at night is like a dream, the farms of Eastern Europe are gingham-checked, and the Great Lakes of the Americas are like little puddles.

The fault lines in San Francisco and the tides under the bridges are a whole new sight, a sight you'd never have seen if you hadn't overcome your fear.

You can see beauty that otherwise would not have come across.

It's time to return to Earth

This is our spaceship, the Soyuz, a small ship.

Once the three of us are on board, this spacecraft will leave the space station and fall into the atmosphere.

These two parts melt, they separate and burn up in the atmosphere.

The only thing that's left is this little bullet-like part that we ride on, which enters the atmosphere, and it's basically like riding a falling meteor back to Earth.

But instead of rushing into the atmosphere screaming in terror -- which would normally happen if you suddenly found yourself on a meteor headed for Earth -- (Laughter) but 20 years ago, we started learning Russian, and then we learned Russian, then we learned orbital mechanics in Russian, then we learned navigation theory, and then we went into the simulator and practiced over and over again.

You can actually pilot this meteor and land it anywhere on Earth within a 15-kilometer radius.

So when we were heading home, instead of screaming in terror as we re-entered the atmosphere in the Soyuz, we were laughing.

And then the big, big parachute opened up, and I knew that if it didn't open, there would be a spare, and it worked in a mechanism that was as precise as a clock.

And like this, it's rushing back to Earth, and this is what it looked like when the Soyuz landed in Kazakhstan.

(Video) Reporter: I see a search-and-rescue helicopter in the sky, and there are about a dozen Russian Mi-8 helicopters in the air.

Touchdown -- 3:14:48 AM Central Time

It's going to spin, and eventually it'll land like it's been thrown to the ground, and it'll tumble to a halt, and that's what I expect.

Eventually, you'll be dragged out into a chair by the Russians who will reach inside the ship, and you'll finally be able to relive that incredible experience.

That 9-year-old boy's overwhelming, terrifying dread that went along with his near-impossible dream. Through practice and learning how to reprogram his reactions and overcoming his primal fear, he was able to experience things that seemed impossible and to come back to Earth with the experience and inspiration to share with others.

Finally, I was asked to play that guitar.

This is a song I sing a lot, and it's a tribute to the incredible talent of David Bowie, but I think it also shows that we're not just machines exploring space, we're human beings, and we can change our capacity to adapt, our capacity to adapt, our capacity to understand things, even our perceptions.

(music) ♫ This is Major Tom to ground control ♫ ♫ We've come so far ♫ ♫ Now we're floating in the weirdest way ♫ ♫ ♫ The stars look so different today ♫

(Applause) Thank you very much.

Thank you very much

Chris Anderson: Mr. Edward Snowden was here a few days ago, and today is your chance to respond.

Several people have sent in questions they'd like to ask our guests from the NSA.

Now, Richard Leggett is the 15th Deputy Director of the National Security Agency (NSA), and he's also a senior civilian officer and chief operating officer, directing strategy, setting internal policy, and serving as chief advisor to the Director.

Now that you're ready, Rick Leggett, welcome to TED.

(Applause) Richard Leggett: Thank you very much for the opportunity to speak with you.

I look forward to speaking with you. Thank you for your arrangement.

Chris: Thank you very much Rick

Thank you for your participation

For the NSA to come out and show that it's open is a very powerful statement.

As you may have seen, Edward Snowden gave a talk and interview here a few days ago.

what did you think?

Rick: That was interesting.

I never expected him to show up, and I want to congratulate all of you for making such wonderful and surprising arrangements.

A lot has happened since Mr. Snowden started leaking classified information, and while some of the stories got to the point, many of them were exaggerations or half-truths, and I want to clarify these things.

I think it's very important to have this conversation in the United States and internationally, so we should make it a fact-based conversation, and we want to help you do that.

CA: The question that many of you here have is, what do you think Mr. Snowden's motives were for what he did, and whether he had any other option but to escape?

Rick: I'm sure he had other options besides just disappearing, and I've positioned him as the kind of whistleblower who undermines legitimate whistleblowers.

If someone who works for the NSA does this -- we have over 35,000 people working here.

they are all great citizens

They are your husbands, fathers, sisters, brothers, neighbors, nephews, friends and relatives alike, all interested in doing what is right for their country and for our allies.

First, the direct superior, and then the higher-level organization within the organization.

If that doesn't satisfy you, there are many inspectors.

In Mr. Snowden's case, he had a choice: the NSA Inspector General, the Navy Inspector General, the Pacific Command Inspector General, the Pentagon Inspector General, and the Intelligence Community Inspector General.

(Chris and Rick speak at the same time) He had the option to go to a congressional committee, and there were institutional procedures to do so, but he never did any of that.

Chris: You said Mr. Snowden had other avenues to raise his concerns.

There are a couple of counter-arguments to that. One, he believed that in his contract status there was no such thing as a hotline for permanent employees.

I mean, under those circumstances, can't you think that what he did was reasonable?

Rick: No I disagree with that

I'm -- I'm sorry, the sound was reverberating through the microphone -- and what he did was inappropriate, because basically in the long run, it's the fact that he endangered people's lives.

really in danger

And there's also a surprising arrogance in that, I think, that he thinks he knows better than the architects of the Constitution about how government is designed and works to separate powers, and about the notion that the executive and legislative branches are intertwined to oversee and balance each other, and the judicial branch oversees the whole process.

It's very arrogant of him to think he knows better.

Chris: Can you give me a concrete example of how he endangered people's lives?

Rick: yeah of course

What he did reveal was information about [intelligence] capabilities, but the NSA is a capability-dependent organization. Now, when we have intelligence targets for us in a foreign country, there are relevant concerns, such as terrorists, which are symbolic examples, but also include human trafficking, drug trafficking, those who seek to build advanced or nuclear weapons, and nations that distribute these or would carry out attacks on neighboring countries. There are many, and our capabilities are being exercised in a very deliberate, methodical and controlled way.

So when our capabilities are exposed indefinitely, it means that the enemy sees them, thinks, "Well, we can't beat this," and runs away from it. In fact, we know that the targets of our attacks, such as terrorists in nation-states, smugglers and others, are fleeing from the realm of our ability to know what they are doing through the exposure of information.

As a result, our associates, whether diplomats or military personnel, and those of our allies who are in similar situations, whether diplomats or military personnel, in dangerous areas abroad are at greater risk, because we do not know the threat that is looming.

Chris: The general reaction was that because of his revelations, access to certain information that you had was cut off and shut down.

The problem is that the very nature of the access itself was not legal in the first place.

So it seems that the Bullrun program is allegedly undermining security for the kind of access that the NSA has to information that you've been talking about.

Rick: Yeah, when our legitimate foreign intelligence agents target the sort of people I just mentioned, they use the global communications system as their means of communication, because it's an amazing system, and it's the most complex system ever devised by humans, and it's amazing, and so many of you out there have been involved in creating and improving it.

But communication systems are also used by people who are doing things against us and our allies.

And if you're going to track them, you have to have the ability to locate them.

If only we could push all the bad guys to the corners of the internet and only use domains like badguy.com

That's great, because we can focus our surveillance there.

But in reality it's not possible

Because they're trying to escape the government's ability to isolate them and stop them from acting, so they have to fight in the same cyberspace.

let me tell you this

The NSA has two missions.

One is a radio intelligence mission, and I know that, unfortunately, a lot has been reported.

The other one is the information assurance mission, which protects the United States' national security system. This system protects the communications that the president uses, the communications that control nuclear weapons, the communications that our military forces use around the world, the communications that we use with our allies, and the communications that our allies themselves use.

So we make recommended standards, we use common standards, and with these provisions, we're making our intended communications secure. We're making our intended communications secure.

Chris: What you're saying about the Internet in general sounds like a fair deal if anything improves the security of the United States.

But I think this is where we disagree.

They see it as an important human invention, on par with, say, Gutenberg's invention of the printing press.

that brings knowledge to all

that connects everything

The Internet is seen in that idealistic view.

And from that point of view, what the NSA did was the same thing that the authorities in Germany did long ago, trying to put some tricks into every printing press to figure out what books people buy and what they read.

Do you understand why people are angry from that point of view?

Rick: Of course I understand, and I agree with you about the usefulness of the internet, and anything bigger than the internet.

I'd like to say that it's a global communication system.

The internet is the majority, but there's a lot more.

People are rightfully concerned about the balance between transparency and confidentiality.

It lies as a kind of balance between privacy and national security.

I don't think it's the right framework

I think it's really a matter of transparency and confidentiality.

We're discussing this nationally and internationally, and I'd like to invite the public to participate openly, not only in our organization.

Now, there's a little more -- there's something else we need to talk about. There are things that need a little more transparency: our authority, our processes, our oversight, and who we are.

We at the NSA didn't do a good job of responding, and I think that's part of the reason why the media was so exposed and caused a sensation.

No one knew who we were. We were a non-existent agency, a silent agency.

There's a mockup of our logo, and it's a falcon wearing headphones.

This is the public image of us

So we need to make our role more transparent.

On the other hand, there are some things we shouldn't open up: things that are bad for the United States, things that are bad for our allies. For the security of this country and its people.

Chris: But wouldn't it also hurt to inflict a heavy blow on the American companies that provide practically most of the Internet services around the world?

Rick: Yes, those companies are in a similar predicament as we are, because we're coercing them to provide information, as every country in the world is doing.

All developed nations have lawful wiretapping programs, and they require companies to provide information they need to defend their nations, and the companies involved are similarly subject to such programs in their respective countries.

China India or France whatever country you can think of as long as you operate there

And the fact that revelations like this make it so widely held that "Company A is untrustworthy because of its privacy questionable" and "Company A is untrustworthy because its privacy is questionable" is indeed true, in the sense that any company doing business in its own country will do the same thing.

In order to take advantage of this revelations and gain a commercial advantage, some countries, including some of our allies, are saying, "Hey, don't trust America, but you can trust our telecommunications companies, they're safe."

In fact, they're using these pitches to compete with large-scale, state-of-the-art technology that US companies have, such as cloud and internet-based technology.

Chris: You're sitting there with the American flag at your side, but now the U.S. Constitution guarantees freedom from absurd search and seizure.

What do you think of the American citizen's right to privacy?

Are there such rights?

Rick: yes of course

We spend a lot of time and pressure ourselves to dedicate an outrageous amount of time and effort to protect privacy.

It's not just for American citizens, it's for the privacy of people around the world.

Various factors come into play here

First, we're all on the same network.

As my own means of communication, I am a user of an Internet e-mail service, the same e-mail service that is most used by terrorists around the world.

So in the Internet world, I'm right next to terrorists.

So we need to pick out only their information and find relevant information.

And so we inevitably run into American citizens and innocent alien citizens who are simply doing their own thing. We run into American citizens and innocent alien citizens.

These are called minimization steps

Constitutional and authorized by the Attorney General Constitutional and authorized by the Attorney General

I work in a legitimate business every day

This is how we protect information every day, for our people and for the citizens of the world.

So I absolutely believe that people have a right to privacy, and that's why I absolutely believe that people have a right to privacy, and I do my best to make sure that that right is protected.

Chris: What about foreigners using internet services from American companies?

Do they have privacy rights too?

Rick: Of course they have. The only time we can compel one of these companies to provide information is if it falls into one of three categories, identified by some kind of selection criteria, which allows us to identify individuals associated with counterterrorism or proliferation or targeting of foreign intelligence.

Chris: A lot has been said about the fact that much of the information we get through these programs is essentially metadata.

It doesn't necessarily have to be the exact message that someone wrote in an email, or the message that they sent over the phone, or the exact message that they sent on the phone.

It's about the "person" who wrote the letter and the "time".

But it's a matter of debate, and someone in the audience here spoke to a former NSA analyst, and he said that metadata is actually far more invasive than CoreData, which is actually much more invasive than CoreData, because in CoreData it's expressed in the person's own words.

With metadata, who knows what conclusions were drawn?

what about that?

Rick: I don't know about that discussion.

I think metadata is important for several reasons.

Metadata provides information about people's connections that they try to hide

When terrorists try to contact people we don't even know, people who are involved in or supporting terrorist activities, or who are trying to provide nuclear-weapons-related material to countries like Iran or North Korea in violation of international sanctions, they know it's illegal, so they try to keep it secret.

Metadata reveals these connections

The alternative is much more inefficient, much more invasive, much less efficient, much more invasive, large collection of content.

Metadata, in that sense, is, in fact, a privacy enhancer.

Unlike the way we treat printed messages, unlike the way we treat printed messages, we discard the profile of ordinary people's metadata without retaining it.

If you're not connected to a legitimate agent's target, you're not our concern.

Chris: How do you place terrorism in the mix of threats facing the United States as a whole?

Rick: I think terrorism is still number one.

I know we are going through unprecedented times, and in more and more places things are going badly and terrorists are taking advantage of the lack of governance to thrive.

My old boss, Admiral Tom Fargo, called it an arc of instability.

In today's world, arcs of unrest are everywhere, and in places like Syria where there's a civil war going on, there's an incredible number of thousands of foreign fighters going into Syria to learn and practice how to be terrorists, including Western countries and in some cases, Westerners with passports that can enter the United States, basically learning how to fight a crusade, and then they leave and then come back (for the crusade).

Places like Iraq are plagued by intense sectarian strife and are breeding grounds for terrorism.

There's also terrorist activity in the "Horn of Africa" ​​(northeast region) and in the Sahel region of Africa.

Again, many weak governance systems create a breeding ground for terrorist activity.

It's a very serious problem. I think terrorism is number one.

The second is cyber threats.

I see cyber as a threat in three ways. The first is probably the most common method that many of you have heard of, and it's intellectual property theft. Basically, foreign countries get involved and steal trade secrets and then pass that information on to state-owned and government-affiliated companies to gain technological breakthroughs and business intelligence to win contracts abroad.

It's happening right now and it could be very painful financially.

is what some nations are doing

The second is an attack that disables service (DoS attack).

As you've probably noticed, attacks like this one against the U.S. financial sector have been going on since 2012.

Again, it's the state that launches the attack, and it's semi-anonymously retaliating, semi-anonymously retaliating.

The last one, the destructive attack, is the one that worries me the most.

they are increasing

In 2012 there was an attack on Saudi Aramco in August 2012

Destroyed about 35,000 computers with a wiper-style virus Destroyed about 35,000 computers with a wiper-style virus

A week later, there was a follow-up, and a Qatari company was attacked.

In March 2013, there was an attack on South Korea, reportedly a North Korean conspiracy, that destroyed thousands of computers.

Attacks like this are on the rise, and in fact, we're seeing people willing to hire people capable of cyberattacks like this.

Chris: Okay, some things here, almost to the heart of the matter.

First of all, many people who look at the risks, and many who look at the numbers, do not understand this belief -- that terrorism is still the greatest threat.

Outside of September 11th, in the last 30 to 40 years, the figure is about 500 Americans have been killed by terrorism, mostly by terrorists in their own countries.

In the last few years, the odds of being killed by terrorism are far less likely than being killed by lightning.

You might say that a single nuclear accident or a bioweapon terrorist campaign would change the statistics forever.

Do you have that view?

Rick: I would like to make two points.

One is that there haven't been any major attacks in the United States since 9/11, and that's no coincidence.

It's because of the hard work of us, other intelligence agencies, the military, and our allies around the world.

As you may know, this is just the tip of the iceberg: NSA operations have helped stop terrorist attacks in 54 cases, 25 of them in Europe, 18 of those 25 in three countries, some of which are our allies.

So it's no coincidence that terrorism kills less.

It's a hard work, it's the product of intelligence to find terrorist activity, and it's lawful enforcement powers, cooperating with other nations, and sometimes using the military to confront terrorists.

I would also like to point out that the threats to nuclear or chemical and biological weapons you mention are not unfounded, in fact there are groups that have been trying to acquire such weapons for years and have taken action to do so.

Chris: In fact, of these 54 alleged incidents, almost none of them had anything to do with the controversial programs that Mr. Snowden exposed and the controversial programs that Mr. Snowden exposed, and the resolution of the needle-in-the-hay incident is said to have been done through other types of espionage. it is said

Needles are said to have been discovered by other means.

Anything about that?

Rick: Yes, there are actually two programs involved in that discussion.

One is the Section 215 program, the U.S. Telephone Metadata Program, and the other is what's commonly called the PRISM program under Section 702 of the FISA Amendment Act.

But only 215 programs are associated with threats to the United States, and there are many threats involving the United States.

I'm sure you'll hear people say things like, "If it hadn't happened," you wouldn't be able to say that there would have been a threat because there was no intelligence program because there was no example.

But it really shows a lack of understanding of how terrorist investigations work.

Imagine you're watching a murder mystery on television.

What do you start with? It starts with the investigation of the corpse, moves on to the investigation of the crime, and tries to solve the problem.

So we're going to start thinking earlier, preferably before the corpse, who the attacker is, and what they're trying to do, and this requires a lot of information.

It's like a mosaic, and you can't tell which one piece of the mosaic is the key element of the mosaic, but you need all the information to build the complete picture.

On the other hand, of those 54 threats, 42 were non-U.S.-related, and the Prism program was heavily involved, and in fact helped stop the attacks.

Chris: Mr. Snowden said two days ago that terrorism is always Chris: Mr. Snowden said two days ago that terrorism is always referred to in the intelligence community as "a pretext for [espionage]" and that's why: terrorism evokes a strong emotional response in people, and the introduction of these programs that otherwise would not have been possible.

Are there any internal discussions about that?

Rick: yes

We debate this all the time, and the debate continues to this day, in the executive branch, in the NSA, in the intelligence community, debating what is the right thing to do, what is the right balance, what is the right thing to do.

It's important to note that the program we're talking about has been sanctioned by two different presidents, by two different parties, twice by Congress, 16 times by federal judges, and not arbitrarily created and run by the NSA.

This was a legitimate act of the United States government, agreed upon by all three branches of the United States government, and President Madison would have been proud.

CA: That said, when Congressmen found out what was actually going on under that authorization, many of them were horribly shocked.

Do you think it's an absurd reaction to being brought into public light while knowing exactly what's going on with the powers you've given them?

Rick: Congress is a big organization.

There are 535 people, and the membership changes frequently, and in the case of the House, it changes every two years, and I believe the NSA provides the Oversight Board with all relevant information, and they control the information that the Oversight Board reports during Congress.

Members of Congress had the opportunity to find out, and in fact, a significant number of them had the power to know because they were tasked with overseeing our responsibility.

And in fact, the chairman of the committee made a public report.

Chris: I don't think anyone would dispute that the cyberattacks you mention are of great concern.

Rick: I have two.

You said the first is to weaken the encryption, but I didn't say that.

The other thing is that the NSA has both of those missions, but we're very defensively biased, and in fact when we find vulnerabilities, overwhelmingly most of the time, we disclose them to the people responsible for making or developing those products.

We've had a pretty good track record of this, and in fact we're trying to be transparent and publish transparent reports, and Internet companies can do the same, and publish transparent reports.

I am trying to make such a proposal

Again, we use what we make.

We use our products to the standards we recommend.We use our products to the standards we recommend.It is our concern to protect our communications as others need it.

Chris: After Edward Snowden's talk, when the robot surrogate was moving around this hall, I heard him talking to a few people, and he was asking about his impressions of the NSA as a whole.

He was certainly very sensible and came on calmly

didn't look crazy

Even if you don't agree with his approach, do you at least agree that he opened the way for discussion of the issues?

Rick: I think it's important to discuss

i don't like his way

There would have been other means, so we wouldn't have endangered our people, or the people of other countries, by losing visibility into what our enemies were doing.

But I think it's a really important conversation.

Chris: There have been reports of disagreements between you and your colleagues on several scenarios as to whether you should make a plea deal with him and pardon him.

Your boss, Secretary Keith Alexander, has said that if you were to negotiate with someone who broke the law like that, it would set a terrible precedent.

But you're on record as saying that if the return of all the documents that Snowden hadn't made public could certainly show, a pardon would be a deal to be considered.

do you still think so?

Rick: Well, actually, what I find interesting about that "60 Minutes" interview is that it's misquoted.

When asked if we could discuss mitigation measures against Mr. Snowden, my actual response was, "Well, it's worth having a conversation."

This is what the Attorney General and the President of the United States actually talked about, and I'm going to turn this case over to the Attorney General, because this is his business.

But American jurisprudence has a strong tradition of bargaining with people accused of crimes and trying to get some advantage if it's in the interest of the government, and there's always been that debate.

There's no conclusion, so there's always room for debate.

Chris: To the general public, it's almost as if he's pointing things in the right direction for the United States government, you, the rest of the world, and how to come up with smarter policies and practices for the future.

Don't you think it's okay to think like that?

Rick: Even with my involvement

It's not for the NSA to decide.

I'd say that's an argument that falls within the Department of Justice.

i leave it to them

Chris: When Rick Ed Snowden finished his story, I gave him a chance to "share an idea worth spreading."

What is your 'idea worth spreading' to the TED group?

Rick: I think it's about knowing the facts.

This is a really important conversation, not just the NSA, not just the government, but you and the Internet companies.

The problem of privacy and personal data is much bigger than government, so get the facts.

Don't let the headlines fool you, don't let the hoax fool you, don't just take the one sided story with a grain of salt.

This is what I consider to be an idea worth spreading.

We have seals, we have badges, we wear badges on our neck straps at work, and if I wear earplugs, my neck strap says,

"Dallas, cowboys," "Go to Dallas."

I just made half the audience feel bad.

The tabs attached to the neck straps of the people in our organization who do the cryptoanalysis work say, "Look at the data."

This is an "idea worth spreading"

look at the data

Chris: Rick, I think it took a lot of courage to come here and talk to these people.

It's something the NSA has done very little in the past, and the technology is getting more and more complex.

I am very grateful that you came out and gave us such an important talk.

thank you very much

Rick: Thanks Chris

(applause)

(Charlie Rose) I got an email from Larry, and he said, let's make sure we don't look like a duo of dull middle-aged guys.

I said, "I'm honored to hear that." (Laughter) Because I'm a little older, and he's a little richer.

(Larry Page) Not so much

CA: So I'm going to talk about the Internet and Google, and then I'm going to talk about search technology and privacy.

Let's talk mainly about the future.

Where is Google and where is it going?

(Paige) We think about that a lot, and the mission we set a long time ago was to organize the world's information and make it useful for everyone.

I'm often asked if this is what I'm doing now.

I often ask myself that question, but I don't know myself.

But actually, when you think about search, it means a lot to all of us, to understand what we want, to understand the world's information -- we're just at the beginning of that, it's really crazy.

We've been working on search for 15 years, and we're far from finished.

(Rose) What will it look like when it's finished?

(Paige) Well, given where we're going -- why aren't we done? It's mostly because computers aren't good.

Computers don't know where you are, what you're doing, or what you know. What we've been doing lately is making devices understand the user's context that makes them useful.

"Google Now" knows where you are, and knows what you might need.

But we're not yet at the point where computers really work, they understand users, they understand information.

It's still unrefined

CA: Where does "deepmind" fit in with what Google is doing right now?

(Paige) Yeah, DeepMind is a company we recently acquired.

I'm in England

So to give you some background, I'm thinking about search, and it's about trying to understand the world -- trying to understand everything that's around you, and making computers more sophisticated and really understanding you -- voice search, for example, is important.

What about today's speech recognition technology?

not so good

Doesn't understand users

So we started looking into machine learning to improve it.

it was very helpful

Then I turned to things like YouTube.

Can you understand YouTube?

So we trained a computer to play YouTube, and the computer discovered itself a cat.

this is important

I realized that this has important implications.

It's very important that we can discover and learn about cats.

The really amazing thing about DeepMind is that it can learn without being taught.

DeepMind started out with video games, but can I show you a video?

CA: Look at this video game, and it's how computers become capable of doing amazing things.

CA: What's amazing is that it's an old game, but DeepMind looked at the same pixels that we see, and it manipulated the game and increased the score.

Now you can play it on a superhuman level, too.

We've never been able to do this with computers before.

Let me explain this

I'm boxing, and the computer is figuring out how to nail down my opponent.

On the left is a computer, and the score is getting higher and higher.

Imagine this kind of intelligence built into things like managing your schedule and giving you the information you need.

We're still at the starting point, and that's what I'm very excited about.

(Rose) Looking at what DeepMind has done in boxing and other things, it seems that artificial intelligence is where we're headed.

Where are we on that path?

(Paige) Well, this is very exciting, like it hasn't been in a long time.

The company was founded by Demis, who studied neuroscience and computer science.

Educated, returning to pursue a PhD in brain science.

There's a lot of interesting work being done at this intersection of computer science and neuroscience, in terms of understanding what it takes to make intelligent things and make them do interesting things.

(Rose) What stage are you at right now?

How fast are you moving forward?

CA: So this is the latest technology right now, understanding things like cats on YouTube, improving speech recognition.

So far, we've been using machine learning to make things better over time, but that example is really exciting, because one program can do so many different things.

(Rose) Okay, here's a picture of that cat.

I would like to see

This is a computer observing a cat and creating an image of what a cat is.

This is an image of what a cat is. Can I submit an image?

(Paige) Oh this (Rose) Can you see the cat?

It's a concept of a computer-captured and drawn cat.

(Paige) Exactly

This is what the computer learned by watching YouTube.

Without being taught anything, without knowing what a cat is. This concept of "cat" is something that humans understand, but computers are starting to understand.

To wrap up the search story, we've started with search, trying to understand people's context and their information.

I have a video for you to see about that, which we found.

(Kenya, Soi Village) (Zak Materre) I planted potatoes a while back.

Suddenly, one after another, they begin to wither

I didn't understand the reason even if I looked it up in the book

So I went out and searched

(Zack Materre Farmer) Diseases of Potatoes

One of the websites told me that ants might be the culprit.

As written, if you sprinkle the ash from burning trees

A few days later the ants were gone

So I came to think that the Internet is amazing.

I have a friend who wants to expand his business.

I went to an internet cafe with him and we looked at various websites together.

The next time I saw him, he was trying to build a windmill for a local school.

I felt proud that suddenly there was something that wasn't there before.

Be aware that not everyone has access to the Internet.

I thought I needed an internet that my grandmother could use.

So I came up with the bulletin board

A simple wooden bulletin board

When I receive information on the phone, I post the information on the bulletin board.

So it's basically like a computer.

i use the internet to help people

I'm looking for ways to make life better for myself and my neighbors.

A lot of people have access to information, but nothing comes after that.

I think knowledge comes after that.

Armed with knowledge, we can figure out solutions ourselves without help.

Information is powerful, but how we use it determines who we are.

(Applause) (Paige) The great thing about that video is that I just read about him in an article and found him out there and made that video.

CA: When it comes to you, everyone who knows you well says, "Larry wants to change the world, and he believes technology is the key."

use the internet for that

I use words

It's also about how people can get online and influence their communities, and that video is a perfect example of that.

CA: Yeah, that's right. As we look to the future, we're placing more emphasis on information access.

We recently launched something called the Rune Project, and we're trying to do that with balloons.

sounds crazy

let me show you the video

2 out of 3 people in the world don't have internet access

We think this is low cost and useful for those people.

(Rose) It's a balloon. (Paige) Yes, it provides internet access.

(Rose) How can you access the Internet in a balloon?

I heard that there's an interesting mechanism that allows you to keep the balloon from being tethered somewhere.

(Paige) This is a good example of innovation.

We've been mulling over this idea for over five years before actually doing it. The starting point of the idea was, "How can we place access points high up in a low-cost way?"

We usually use satellites, but they take a long time to launch.

You've seen how easy it is to launch a balloon, and that's thanks to the Internet.

I thought there was no reason why we couldn't do it now.

That's what started this project

(Rose) But at the mercy of the wind, right?

(Paige) Yes, but we've done climate simulations that are probably unprecedented, and we've found that if we can control the altitude of the balloon -- which can be done by moving air in and out, etc. -- we can roughly control where the balloon goes.

CA: Now I'm going to talk about the future and transportation, all of the things you've been obsessed with lately -- transportation systems, self-driving cars, bicycles -- but before I get to that, I'd like to touch on what happened with Snowden.

security and privacy

I've been thinking about this for a long time

(Paige) Of course.

I saw a picture of Sergey with Snowden yesterday.

Some of you may have seen

Privacy and security are important to me

We think of these two things together. Privacy is nothing without security.

I'm very disappointed that the government was doing these things in secret and not letting us know.

There's no democracy if we have to protect everyone from government actions we've never heard of.

I'm not saying that we need to know the specifics of terrorism that governments are concerned about and are trying to protect their citizens from, but that we need to know what the factors are, and to what extent, and what kind of oversight we have from governments.

And as a result, I think the government has been very embarrassed by keeping this whole thing under wraps.

(Rose) You said you never came to Google for advice.

(Paige) You should speak publicly, not Google.

We should discuss this publicly, otherwise democracy doesn't work.

that's impossible

So it's unfortunate that Google finds itself in the position of having to protect you and your users from covert government surveillance that no one knows about.

It's a complete mess

(Rose) And then there's also privacy.

(Paige) Yeah, the world is changing when it comes to privacy.

Everyone has a cell phone and they know where they are

There's so much information about individuals these days, and that's important, and I think it's no surprise that people have difficult arguments.

We've spent a lot of time thinking about what the problem is here.

First -- I think what we need to do is let people know what information is being collected, whether it's search history or location, and give them choices.

Incognito mode in Chrome is great, and I want more people to have this option, and I want them to know about it.

i don't think it's difficult

What I'm worried about is important things along with useless things

For example, I lost my voice and I haven't recovered from it.

When I'm talking to you, I want my voice back

(Rose) Anything I can do

(Paige) Well, let's do a spell with a voodoo doll.

So when I went public with this disease, a lot of information came in.

I took a questionnaire about symptoms from people with similar problems, and when I looked at their medical records, I thought, "Wouldn't it be great if everyone's medical records were shared anonymously for research?"

If someone has access to their medical records, say, a research doctor, they might be able to see which doctor accessed it and why, and they might be able to figure out what their symptoms are.

That would save 100,000 lives every year.

(Rose) That makes sense. (Applause) (Paige) So what I'm worried about is that the security of the Internet will end up looking like medical records today, burying important data.

CA: The prerequisite for that is an environment where people can be confident that their information will not be misused.

(Paige) Yeah, when I got this voice

I was afraid to make the information public.

Tell me that Sergei should do it, and it's actually been great.

(Rose) The reaction was more than I expected.

(Paige) Everyone was very positive.

Thousands of people have similar symptoms, but we have no information about it today.

so glad to share

(Rose) Now about the future, what are you doing about the transportation system?

CA: I think I've been frustrated since I was at the University of Michigan.

In the cold snow to get on the bus

because i had to wait

I started researching how much it would cost, and I was kind of obsessed with the transportation system.

CA: So that's how you got the idea for the self-driving car.

Page: 18 years ago, I found out about people developing self-driving cars, and I fell in love with it.

More than 20 million people are involved in accidents every year

It's also the leading cause of death for Americans under the age of 34.

(Rose) I mean, I want to save lives.

(Paige) Yeah, and it's about making good use of space and enriching our lives.

Los Angeles is half parking lots and roads, half the area, and most other cities are no different.

It's crazy. That's how we use our space.

(Rose) When do you think that will happen?

(Paige) We're almost there.

It has over 100,000 miles and is now fully autonomous.

I'm happy that we can bring self-driving cars to the world so quickly.

CA: But it's not just self-driving cars, is it?

Do you have an idea for a bicycle?

(Paige) Yeah, Google has been talking about giving people free bikes, and it's been working really well so far.

Bicycles run everywhere, and bicycles wear out,

It's been used all day long

(Rose) You want it to run in the air instead of on the road.

(Paige) How do we get people to use bicycles more?

(Rose) There was a video.

(Paige) yeah let's see

this is exciting

(music) Here's an idea to cut the bike off the road at a low cost.

It seems crazy, but when I thought about the Google campus, and when I got to work with the city government, and I wanted to increase the use of bicycles, I thought, How can we separate the bicycles from the cars without incurring any costs?

So I searched and found

We're not actually working on this, but it's inspiring the imagination.

(Rose) Finally

tell me about your own philosophy

You had the idea of ​​"Google X"

You want more than progress that can be measured with a small ruler.

Paige: Yeah, most of what we just talked about. For example, in economics there's the concept of additionality, which means you're doing something that didn't exist if you didn't start it.

The more we do that, the more impact we can have. It means doing things that people never thought they could do.

All my life, the more I know about technology, the more I realize how much I don't know, because the more I learn about technology, the more I see new things that can be done.

For example, the reason I knew that balloons could be done was because I knew the ingredients that could be used to make them happen.

CA: That's what I find interesting about you. There are a lot of people who think about the future, and they come up with ideas, but it's hard to find people who make them happen.

For example, I'm sure you're familiar with it, and maybe you've read about it, Tesla.

What are your principles?

(Paige) Invention is not enough.

When he invented something -- Tesla invented the electricity we use every day -- he struggled to get it out there.

it was done by someone else

it took time

If the two forces combined -- the power of innovation and invention, and the power of business to commercialize it and bring it to people -- then it would be good for the world, and it would bring hope to people.

I am thrilled that the Loon Project is giving hope and hope to two-thirds of the world's population without internet.

CA: That's the other side of the enterprise.

You're one of those people who believes that companies are agents of change, if they're run well.

CA: Yeah, it's unfortunate that so many people think that corporations are fundamentally evil.

Business gets unfounded criticism

Well, there are some places where it applies

Companies continue to do things in the same incremental way they did 20 or 50 years ago.

what we need is not

Especially in technology, we need transformational change, not incremental change.

CA: You said before, if I understand correctly, that if I were to leave my fortune for something, I'd rather give it to Elon Musk than donate it to charity, because I believe he's going to change the future.

we share similar goals

Google has a lot of employees who have become pretty wealthy.

They're all very profitable in technology.

Many of the people in this hall are wealthy.

You work because you want to change the world, right?

I want to make the world a better place

Your company should be worth not only your time, but your money as well.

but it is not considered

Companies aren't thought of like that, and that's a shame. Companies are a huge part of our effort.

It's where people spend most of their time and money, and that's why people want to help more companies.

CA: I often ask this question at the end of an interview. What kind of mindset, what kind of mindset do you think made you successful?

Rupert Murdoch, for example, said it was "curiosity," and so did other people in the media industry.

Bill Gates and Warren Buffett called it 'focus'

In your case, what made you see the future and simultaneously reinvent the present, reinvent the present at the same time?

CA: Perhaps most importantly, I've looked at a lot of companies and wondered why they didn't last long.

Many companies have come and gone,

what did they do wrong? thought

A common mistake is

In many cases, it just boils down to not looking to the future.

So I'm going to focus on that point and think about what the future will look like, how can we create it, and how can I focus my company on that future, how can I help create the future?

So it's curiosity, because there's real value in looking at things that other people don't think about and doing things that no one else is doing.

For example android

At first, I felt guilty about working on an android.

It was just a small venture when we acquired it.

Because it wasn't what we were originally working on.

It didn't seem right to spend time on it.

it was a stupid idea

there was a future

I'm glad I took care of that.

(Rose) this way with you

It's nice to talk to you. It's an honor to be here with you.

thank you larry

(Paige) Thank you

(Applause) (Rose) It was Larry Page.

If you ask people what the name of the bacteria that lives in their gut is, most people will say E. coli.

That's right, E. coli is the most famous intestinal bacterium.

But it turns out that E. coli in your gut is about a thousand times less than other types of bacteria, many of which you probably haven't heard of before.

For example, bacteria like Bacteroides and Prevotella.

These two types are by far the most common intestinal bacteria in modern humans.

100 trillion bacteria live in your body

This is what we call your microbiome. It's the little world that lives inside you, it's like the universe.

100 trillion is enough to cover a million American football fields if you planted one lawn for every bacteria in your gut.

incredibly complicated

Interestingly, though, as our bodies adapt to modern life, we're losing some of our normal gut bacteria, and at the same time, a wide variety of intestinal diseases are on the rise in developed countries around the world.

You know people who are obese, who have diabetes, who have Crohn's disease, who have ulcerative colitis, who have allergies, who have asthma.

All of these diseases and many metabolic and autoimmune diseases are associated with loss of diversity of healthy gut bacteria.

In my lab, when we first observed this symptom, we were actually working with primates, not humans.

I was investigating what happens to the microbiome of monkeys that are moved from the jungle to the zoo.

What about changes in the microbiome? New bacterial colonization?

Are there any bacteria that have decreased? Will it make you feel better? does it get worse?

We've tracked two species of monkeys in the jungle, one from Vietnam and one from Costa Rica, and we've sequenced DNA from their droppings.

In my lab, this is how we study the microbiome.

The DNA sequences showed that in the wild, the composition of the gut bacteria was completely different between the two species.

It was as if that kind of feature was showing up.

But after they were moved to zoos, they lost most of their bacterial diversity and were colonized by new combinations of bacteria.

it was very strange

There are two types of microbiome

For wild monkeys, it was like a lush rainforest.

This is what we call "diversity" here.

And monkeys in zoos were losing diversity.

A scorched rainforest is overrun by a handful of alien species —

That's what the caged primate microbiome looks like.

Now, at the same time, many of the animals in the zoo are not feeling well.

A few animals were obese, weak, gastroenteritis, diarrhea, bloating, and moribund.

Now, of course, what we were very interested in was, who are these so-called exotic gut bacteria that are taking over zoos? was

So when we tested the DNA again, we found that all the monkeys in the zoo were overwhelmingly filled with Bacteroidetes and Prevotella, the same gut bacteria that we have in our guts today.

I wanted to visualize that, so I used ecology's multivariate tools to put all the microbiomes under study on the xy axis.

Here's a plot showing that distance, and the points on the plot are the microbiomes of individual animals.

Each dot is like a microbial universe.

Microbiomes, the more bacteria they have in common, the closer they are.

the farther apart you have different bacteria

You can see from this diagram that the two species of wild monkeys are grouped together on the left.

On the top left is a (wild) monkey called the red-shanked douc langur, an endangered species in Vietnam.

Bottom left is a (wild) monkey from Costa Rica

You can see that the microbiome is very different in the wild.

When these two species of monkeys are housed in zoos, they both congregate in the same place in the diagram, which means their microbiomes change and they become more like each other, whether it's in zoos on other continents, in different geographies, or with different diets.

We also studied other kinds of primates.

What primate do you think is even more distant from a wild primate than a caged primate?

I am modern

This is from a human in a developing country.

Farther away from wild monkeys than zoo monkeys.

And the last group we studied was the group on the far right, people living in the United States.

When I saw this picture, it sent shivers down my spine, because there's another way to think about it: "Interesting, monkeys in cages are in some ways evolving into Americans."

(Laughter) But there's another way to think about it: Americans are big caged monkeys.

In fact, when I was looking at this diagram on my computer, news broke that four red-shanked douc langurs in the zoo had died of intestinal disease.

For certain types of animals, having the right bacteria in their gut could be the difference between life and death.

Now let's apply this to humans.

In Americans, of course, the microbiome doesn't cause premature deaths as often as it does in zoos, but Americans are at risk of obesity, diabetes, and many other diseases.

This isn't just true for people who have lived in America for generations. It's also true for immigrants and refugees. Most immigrants and refugees arrive in America without metabolic disease, but within a few years they're at high risk for obesity and diabetes, just like the rest of America.

I discussed this issue with two ethnic groups that continue to migrate to the United States from Southeast Asia: the Hmong, who arrived in the mid-1970s as refugees fleeing the Vietnam War and the Laotian Civil War, and the Karen, who more recently began migrating as refugees from Myanmar.

We've spent several years working with local communities and medical practitioners to study how the Hmong and Karen microbiomes change after they migrate to the United States from villages and refugee camps in Thailand.

So what they found was that when people from that ethnic group came to America, they lost a significant percentage of their microbiome, about 20 percent.

So just by moving to the United States, the gut microbiota undergoes dramatic changes, perhaps for the worse.

Is it the bacteria that causes obesity? Or does obesity alter bacterial proportions?

And that's what we're tracking right now, and when we combine the evidence that we have in my lab right now with that in labs around the world, we know that certain types of changes in the microbiome lead to many of the so-called modern-day diseases, including obesity.

The good news is that you can actually change your microbiome.

Because it's a living organism, not a genome. And there's a lot of research going on right now to figure out how to repair the microbiome when it's degraded, either by diet or by using live bacteria.

And our next step is to collect and preserve bacteria from healthy people around the world, so that they can be preserved as the cultural heritage of their peoples, and may help protect them as they adapt to modern society, as well as future generations who are now growing up in an environment where the risk of related diseases increases from generation to generation.

I look forward to a future where we have the technology we need to repair and replenish our microbiome, where monkeys will be happier and healthier, and so will humans.

(applause)

In many patriarchal and tribal societies, fathers become famous for their sons' careers, but I'm one of the few fathers whose daughters make a name for themselves, and I'm honored to do this.

(Applause) Malala started her campaign for education, standing up for women's rights, in 2007. Her efforts were recognized in 2011, when she was awarded the National Peace Prize by the government of Pakistan.

Before Malala was Ziauddin's daughter, now I'm Malala's father.

Ladies and gentlemen, as we look back at the history of mankind, the history of women is a story of injustice, of inequality, violence and exploitation.

As we all know, patriarchal society begins when a child is born, and when a girl is born, her birth is not celebrated.

No one welcomes you, not even your biological parents.

Neighbors come to comfort the mother, but no one says "Congratulations" to the father.

Giving birth to a girl makes mothers feel very embarrassed.

When my first child was a girl, my mother was sad

When the second child is a girl, the mother is shocked, hoping it will be a son this time, but when the third child is also a girl, she feels criminally guilty.

This suffering doesn't just belong to the mother.

When she turns five, she's old enough to go to school, but she has to stay home, while her siblings can go to school.

Until she's 12, she'll manage to make a good living.

can be fun

I can play with my friends on the street, or I can walk outside by myself, free like a butterfly.

But in their teens -- when they're 13 -- women aren't allowed to go out without a man's escort.

I'm stuck in my house

I'm no longer an individual who can celebrate his freedom.

Women become what they call "honor" to their fathers, brothers, and families, and when women violate this honor, they can even be killed.

Interestingly, this thing called "honor" not only affects the lives of girls, but it also affects the lives of the men in the family.

There is a family of seven daughters and a son, and this one son has gone to work in the Gulf countries to feed his seven sisters and his parents, because the seven sisters think it's a shame to hone their skills and leave home to earn a living.

So he's sacrificing his own joie de vivre and his sister's happiness for what they call "honor."

Another norm in patriarchal society is called obedience.

Being a good girl requires you to be very quiet and humble and very obedient.

this is a good condition

A good girl must be quiet

They are asked to quietly accept decisions made by their fathers, mothers, and elders, even if they don't like them.

That's why I have to accept marrying a man I don't like, or a man who's older than me, because I don't want to be perceived as lacking obedience.

Even if you are forced to marry young, you have to accept it.

Because otherwise you'll be branded as disobedient.

What do you think will happen?

In the words of a poetess, "I was forced to marry, I was forced into a conjugal relationship, and I gave birth to sons and daughters, son after daughter."

What's ironic about this situation is that this mother teaches the same importance of obedience to her daughter, and she teaches the same importance of honor to her son.

And so the vicious cycle continues endlessly.

Ladies and gentlemen, the only way to change the plight of millions of women is to think differently. For men and women to change the way they think. For men and women in tribal and patriarchal societies in the developing world to break some norms in their families and societies.

My dear brothers and sisters, the day Malala was born, the first thing that came to my mind -- I was really not good with newborn babies -- was when I looked into Malala's eyes when she was just born, and I felt so proud.

I knew her name long before she was born, and I was fascinated by the legendary heroine who fought for freedom in Afghanistan.

She was called Malalai of Maiwand and her daughter was named after her.

A few days after Malala was born, my cousin came over to my house and happened to bring me a family tree, which I looked at in the Yousafzai family tree, and it traced my ancestors back 300 years.

But it was just a man's name, and I took a pen and underlined my name and wrote, "Malala."

When she grew up to be four and a half years old, I admitted her to my school.

Does it make you wonder that I dare to mention admissions for girls?

yes i have to talk

In Canada, the United States, and many other developed countries, it may be taken for granted, but in poorer countries, patriarchal societies, tribal societies, schooling is a big deal for girls.

Being able to go to school means having your identity and your name recognized.

Going to school means stepping into a place where you can explore your potential for the future, where your dreams and hopes come true.

I have five sisters, and none of them have been able to go to school. You might be surprised, but two weeks ago, I was filling out my Canadian visa application, and there was a section about my family, and I couldn't remember the last names of some of my sisters.

Because I've never seen a single document with my sister's name on it.

Because of this, I cherished my daughter

What my father didn't give to my sisters, my father's daughters, I knew I had to change this.

I have treasured my daughter's intelligence and intelligence.

When my friend comes over, I let my daughter sit by my side.

I took him with me to various meetings.

I hoped that all these good values ​​would take root in her.

This is not just Malala's request.

I taught all of these good values ​​to every student in my school, regardless of gender.

liberated children through education

What I've taught my girls, my schoolgirls, is not to learn the lesson of obedience.

I taught my boys not to learn false honors.

Dear brothers and sisters, we have fought for women's rights, and we have strived to create more and more room for women in society.

However, a new obstacle stood in the way

threaten human rights and endanger women's rights in particular

It's called Talibanization

Under Taliban rule, women's participation in all political, economic and social activities is completely denied.

Hundreds of schools destroyed

girls are forbidden to go to school

Women were forced to wear veils and were not even allowed to go shopping at the market.

The music was taken away, the girl was whipped, the singer was killed

Millions of people suffered, but few spoke out. The scariest thing would be to speak up for your rights in a time of murder and flogging.

I was really scared

Malala stood up for her right to an education when she was 10 years old.

I wrote diaries on the BBC's blog, collaborated on a short documentary for the New York Times, and spoke out everywhere.

Malala's voice was the most powerful

The voice is gaining momentum and spreading around the world

This was why the Taliban could no longer tolerate her activities. On October 9, 2012, Malala was shot at point-blank range in the forehead.

It was the end of the world for me and my family.

The world has been swallowed by a big black hole

While my daughter was hovering between life and death, I muttered in my wife's ear, "Am I responsible for what happened to our daughter?"

She immediately said, "Please don't blame yourself

you stood up for justice

You risked your life to seek the truth, to seek peace, to seek education. Inspired by you, my daughter followed suit.

Both of them have walked the right path, so God will surely protect Malala."

These words helped me never blame myself again

When Malala was in the hospital in excruciating pain and had severe headaches from nerve damage to her face, I used to see the dark shadows on her wife's face.

Even then, my daughter didn't complain.

He often told us, "Even if you can't smile, it's okay if your face is numb.

I'll be fine, so please don't worry."

she comforted us and healed us

My dear brothers and sisters, what we have learned from Malala is the power to persevere even in the most difficult of times. I would like to share with you that even though Malala is a symbol of hope for the restoration of children's and women's rights, she is no different than any other 16-year-old girl.

I cry when I don't finish my homework

I fight with my brothers, that makes me very happy

People around me ask me for tips on how to raise a child as strong, brave, eloquent and calm as Malala.

My answer was, "I didn't do anything for you.

It must be because I didn't do something

I didn't cut off her 'wings', that's all."

thank you

(Applause) Thank you, thank you very much. (Applause)

Flocks of wild animals, flocks of fish, formations of birds

All kinds of animals in groups, and it's one of the most spectacular sights you'll see in nature.

But why the collective

A common answer is that it's for protection against predators, for cooperative prey capture, for reproduction and reproduction. Most of these theories are correct, but they make big assumptions about animal behavior: the assumption that it's the animal itself that controls its behavior and body.

In fact, it is often not

This is Artemia (brine shrimp)

You may be more familiar with the brand name "Sea Monkey".

They are small and usually solitary, but sometimes they form large red clusters like this one that can spread for many meters and are caused by parasites.

These shrimp relatives are infested with tapeworms.

A tapeworm is like a long intestine with a mouth on the opposite side of the genitalia.

As a freelance journalist, I can't help but sympathize. (Laughter)

As a freelance journalist, I can't help but sympathize (Laughter).

It renders Artemia sterile, turns its transparent body red, prolongs its lifespan, and -- as biologist Nicholas Lord discovered, it induces them to behave in groups.

why would you do that? The reason is that tapeworms, like many other parasites, have a complex life cycle and can take on many different hosts.

Artemia is just one step in that process.

The tapeworm's ultimate destination is here, the greater flamingo.

The tapeworm can only reproduce inside a flamingo, so in order to get there, it manipulates its host, Artemia, into forming brightly colored colonies that are easier for flamingos to find and eat.

They're not being social out of their own will, they're being manipulated into doing so.

Not to protect yourself from natural enemies

rather the opposite

A tapeworm has taken over your head and body, turning you into a vehicle to get to the flamingo.

Here's another example of parasite control.

This is a cricket that commits suicide.

This cricket has eaten a wireworm larvae.

These parasites develop into adult worms inside the body, but they must return to the water to mate and lay eggs, which is why they release proteins that confuse the cricket's head and cause it to behave strangely.

When a cricket is near water, like a pool like this, it jumps in and drowns, and wire bugs crawl out of their carcasses.

The inside of the cricket is quite spacious, isn't it?

But it's not just tapeworms and wireworms.

There are many other mind-controlling parasites, such as fungi, viruses, and insects, and these parasites skillfully control the will of their hosts.

My first encounter with these creatures was when I saw David Attenborough's "The Trial of Life" 20 years ago, and I learned more about it in my friend Carl Zimmer's book "Parasite Rex."

I've been writing about these creatures ever since.

I've never had a more exciting biology story.

Maybe my brain has become infested with parasites too.

There's something irresistible about parasites, and they're wonderfully creepy.

Parasite descriptions are full of provocative words: "devour the host alive" and "break out of the body."

(Laughter) But that's not all.

Like all writers, I like funny stories.

Parasites won't let me write stories that are easily predictable.

In their world, the unexpected happens that surprises the reader.

For example, this caterpillar thrashes around violently when other insects approach it, and when other insects approach it, it seems to be guarding a white cocoon. Why?

Are you protecting your brothers?

wrong

In fact, this caterpillar is attacked by a parasitic wasp and lays its eggs.

The parasitic wasp larvae that are born eat the caterpillar alive and come out ripping open its body.

Is that what you said?

Actually the caterpillar is not dead

A few larvae of the parasitic wasp remain inside, manipulating the caterpillar from within to protect the emerging siblings and allow them to grow safely inside the chrysalis.

This headbanging zombie bodyguard is protecting the child of the enemy who killed him.

(Applause) Let's move on, because we only have 13 minutes. (Laughter) Now, just for comfort, some of you may be trying to believe that this is a rare phenomenon in nature.

It's not surprising that we usually don't care, but that doesn't mean we forget its importance.

A few years ago, a man named Kevin Rafferty led a group of researchers who traveled to three California river mouths, weighed and dissected all the creatures there, and what they found was that parasites were extremely abundant.

Especially abundant were flukes, parasites that render their hosts sterile. Look at this tragic snail.

Now, even though these flukes are small and microscopic, the total weight of the flukes living there is about the same as the fish in the entire estuary, and three to nine times more than the birds.

The wire bug I showed you earlier That cricket... remember that one?

A Japanese scientist named Takuya Sato observed that in a stream, there were a lot of crickets and grasshoppers that were thrown into the river by parasites, and they accounted for 60% of the food of the trout living there.

Host dominance is far from rare

It's an important and everyday thing in the ecosystems around us. Recently, scientists have discovered a lot of these parasitic manipulations, and what's even more interesting is that we're increasingly understanding how these organisms control their hosts.

This is my favorite example

It's Amparex Compressor, commonly known as the emerald cockroach wasp. It's well known that emerald cockroach wasps will seek out cockroaches once they have a fertilized egg in their body.

And when it finds a cockroach, it pricks it with a stinger, and the stinger is also a sensory organ.

This was just clarified three weeks ago.

On the surface of this stinger are tiny bumpy sensors that are used to sense the unique sensations of a cockroach's brain.

Like someone fumbling around in a bag, they use a needle to locate the brain, and then they inject the poison into two ganglia in the brain.

Israeli scientists Frederick Riversat and Ram Gall have figured out that this poison is a special kind of chemical weapon.

It doesn't kill cockroaches or put them to sleep.

Cockroaches can walk, fly, run, if they try to escape, they can escape, but they don't because the venom makes them lose the desire to move, and that's it.

The bee unchecks the "flee if dangerous" checkbox from the cockroach's head, and like walking a dog, it pulls the prey's tentacles back to the hive.

There, it lays its eggs in its body, and the larvae eat up the living host, then rip open its body, and then... it's the pattern.

(Laughter) (Applause) I think that once a cockroach is stung, it's no longer a cockroach.

It becomes part of the bee, like the cricket became part of the wire bug.

the host does not survive or reproduce

You don't decide what to do, it's like a car.

Once the parasite has taken over, there is no way to resist the host.

Of course, even humans are often manipulated.

When drugs change the chemical balance in the brain, it changes the mood. Arguments, advertisements, and big ideas are all used to change other people's minds, right?

But these methods are crude compared to the parasite's honed precision.

Even Don Draper in "Mad Men" would admire the dexterity of the Emerald Cockroach Wasp.

That's where parasites get creepy and intriguing.

For those of us who value free will and free thought, the prospect of being robbed of it by an unseen force arouses a deep societal fear in us.

Orwellian dystopias, secret societies, and evil bosses who manipulate the human mind.

Of course, when you know that, you can't help but wonder if there are other creepy, sinister parasites that are influencing our behavior without us even realizing it—besides the NSA?

Something like -- (Laughter) (Applause) Could a sniper's crosshair have hit my forehead?

(Laughter) If there is such a thing, this is a good candidate.

Toxoplasma, I call it "Tokiso" for short. It's better to call scary things by cute names.

Toxo parasitizes mammals, it lives in many different mammals, but it can reproduce only in cats.

Researchers such as Joanne Webster have discovered that when a toxo gets into a mouse, it turns the mouse into a "cat-seeking missile."

When host rats smell cat urine, they are attracted to it and run towards the source of the odor, instead of fleeing in the opposite direction.

Cats eat mice Toxo falls in love with cats

This is the famous story "Eat, Pray, Love"

(Laughter) (Applause) What kind people.

Elizabeth (Gilbert) Thank you for the wonderful story.

But how does a parasite control its host in this way?

still not sure

The enzyme that Toxo makes is a precursor to dopamine, which is responsible for motivation and reward.

This substance stimulates certain parts of the mouse's brain, such as the part that is sexually aroused.

But it's not yet clear how these will fit together.

What is clear is that this organism is unicellular.

without a nervous system

not even conscious

I don't even have a body

Despite that, I can control mammals.

we are mammals

They're much smarter than rats, but their brains are basically the same: they're made up of similar cells, they work with the same chemicals, they have the same parasites.

Estimates vary, but according to some data, one in three people in the world has toxo parasites in their brains.

This doesn't usually cause overt illness.

The parasite stays dormant for a long time

But we also know that while only a small percentage of people with Toxo are infected, there are some indications that there may be differences in personality test results, a slightly higher risk of being in a car accident, and that many people with schizophrenia may be infected.

The evidence is still inconclusive, and even Toxo experts disagree about how this parasite affects our behavior.

Considering that there are things out there that manipulate other creatures, it's hard to imagine humans being the only ones unaffected.

I think it's amazing that parasites have the ability to constantly change the way we see the world.

Parasites teach us to look at the natural world in a slightly different light, and it makes us wonder whether the behavior of living organisms, from the clear and simple to the complex and difficult, may not be the result of the organism's own willful actions, but may be manipulated by someone else.

It's creepy to think about it, and the parasite's habits are terrifying, but their ability to surprise us is amazing, and in some ways even fascinating, and it's on par with pandas, butterflies, and dolphins.

At the end of "The Origin of Species," Charles Darwin said of the magnificence of life, that diversity is the most beautiful and wonderful thing.

But it might be the work of parasites that makes you think so.

thank you

(applause)

good morning

When I was a boy, something happened that changed my life and made me who I am today.

It had a huge impact on how I think about art, design and engineering.

I grew up in a happy environment, in a loving family of talented artists and in one of the greatest cities in the world.

My father, John Phelen, who died when I was 15, was an artist both by passion and by profession, and so was my mother, Ray.

My father was a member of the New York Abstract Expressionist movement, and along with other painters of his generation, he created American modern art, and helped push American ideology toward 20th-century modernism.

Isn't it amazing, compared to the thousands of years of figurative painting, the history of modern art is only 15 minutes, and it's still expanding.

Like many other important innovations, these revolutionary ideas weren't born of new technology, but of fresh ideas, a willingness to experiment, and the ability to withstand criticism and rejection from many quarters.

Art was everywhere in my house.

It was like the oxygen that is essential to our life.

As I watched my father work, he taught me that art is not a decoration, but a way of communicating an idea, and that it might be able to combine knowledge and insight.

In such a rich artistic environment, you would think that I had entered the world of art, but no.

I embarrassed my parents, as many other children are born with.

I had no interest in being an artist, much less a painter.

What I loved was electronics and machines, taking them apart and making new things and making them work.

I was lucky enough to have engineers in my family, and along with my parents, they became my first role models.

they were all very hard working

My grandfather ran a factory in Brooklyn that made sheet metal cupboards.

On weekends, my grandfather and I would often go to New York City's Electric Town on Cortland Street.

It was full of surplus electronic equipment, and I took home treasures like the Norden bombsight and parts for IBM's first vacuum-tube computer for a few bucks.

These were valuable and attractive to me

I learned about engineering and how things work, not in school, but by taking apart and examining these incredibly complex machines.

I did this for hours every day, apparently I escaped electrocution.

it was a lot of fun

But sadly, every summer my parents and I went on trips abroad to experience history, art and design, and these machines were left at home.

I visited wonderful museums and monuments in Europe and the Middle East, but to satisfy my interest in science and technology, they took me to places like the Science Museum in London, where I lost track of time and learned about the history of science and technology.

I went to Rome when I was nine years old

It was a particularly hot summer day, and we visited a drum-shaped structure that didn't look particularly interesting from the outside.

My father told me it was the Pantheon, the temple of the gods.

From the outside, it didn't look anything special, but when I went inside, I was struck by three things.

It was very dark in there, and the only light came through a large hole in the roof.

My father told me it wasn't a hole, it was an "oculus" that looked up into the sky.

There was something special about that place, I don't know why, but I just felt it.

I walked to the center of the building and looked up from the oculus

It was the first church to show us the unrestrained view between God and man.

I wondered what to do when it suddenly rains

My dad called it an oculus, but it's actually a big hole in the roof.

I found a stone floor that had been scraped into a drain.

I got used to the darkness inside, and I could see the details of the floor and the walls around me.

Nothing special, the statues that are everywhere in Rome were also seen here.

A marble seller from the Appian Way appeared and showed Hadrian his catalogue.

(Laughter) That ceiling was amazing.

It looked like Buckminster Fuller's geodesic dome.

I've seen it before Bucky is my father's friend

It's modern, highly technological, and imposingly huge, the same 42 meters in diameter and height.

i fell in love with this place

It was the most beautiful thing I'd ever seen, and when I asked my dad, "When did you make it?"

"About 2000 years ago," I replied.

I said, "No, I mean the roof."

The original roof looked like a modern roof that had been destroyed in past wars and replaced.

My father said, "This is the original roof."

That moment changed my life and I can remember it like it was yesterday

It never occurred to me that people 2,000 years ago were so smart. (Laughter) It had never occurred to me before.

For me, the Giza Pyramids, which I visited a few years ago, are certainly impressive and wonderfully designed, but with an unlimited budget, 20,000 to 40,000 workers, and 10 to 20 years of quarrying and transporting them across the country, I could build the pyramids myself.

But no amount of muscle can build the dome of the Pantheon, 2,000 years ago, or today.

Incidentally, it's also the largest unreinforced concrete dome ever built.

It's a miracle that the Pantheon was created.

By miraculous, I mean technically marginal, very risky, and possibly impossible even today. I don't think you can do it.

For example, here is also the miracle of the Pantheon.

To make it structurally possible, we had to invent a very strong concrete, and to control the weight, we varied the density of the aggregate towards the top of the dome.

To make the dome's structure strong and light, five rings of coffers were used, gradually decreasing in size, which gave the design a dramatic and accentuated perspective.

The reason it was so cool inside was because of the huge thermal mass and the natural updrafts coming out of the oculus and the Venturi effect of the wind blowing over the top of the building.

It was then that I discovered for the first time that light itself was matter.

The ray of light from the oculus was beautiful and tactile, and for the first time I knew that light could be designed.

Moreover, all forms of design, visual design, without light, means nothing, because without light, nothing is seen.

I'm not the first to think this is a very special place.

It is the longest standing building in history that has withstood gravity, barbarians, marauders, urban development and the devastation of many years.

Coming here has helped me understand that the world of art and design is not at odds with science and technology, unlike what I learned in school.

Furthermore, by combining them, we can create wonderful things, which cannot be realized by each field alone.

But in school, without exception, we were taught, and still are, that they were different worlds.

My teacher taught me that I had to focus on one thing and take it seriously.

But being forced to specialize made me feel more and more the value of versatility, polymath, Michelangelo, Leonardo da Vinci, Benjamin Franklin, people who did exactly the opposite.

And I followed them and wanted to be in both worlds.

Like the Pantheon, how do we realize these projects, which are as creative and technologically complex as ever?

Like Hadrian, we need a wonderfully creative vision.

And then you also need the ability to communicate and the leadership to get funding and execute, and you must be technically savvy in the capacity and practical ways to further develop innovation.

To bring about such a revolution, we must achieve five miracles.

The problem is that no matter how talented, how wealthy and how smart a person is, he can only do one miracle or one and a half miracles.

That's it, that's my share

You run out of time, money, passion, whatever.

Most people can't even imagine one of these miracles. It takes five to make a pantheon.

In my experience, people who can think beyond the worlds of art, design, and engineering have the ability to notice when others offer them miracles and make their goals possible.

Their vision is so clear that they muster up the courage and determination to create more miracles and transform seemingly insurmountable obstacles into something distinctive.

Consider the Oculus of the Pantheon

Advocating that design is the primary means that the structural techniques developed for the arches of Roman architecture can hardly be used.

But when we take the technology and rethink the weight and stress distribution, we realize that the design only works if there's a big hole in the roof.

And when that's done, you get the aesthetic design utility of light, coolness, and most importantly, a direct connection to heaven.

well done

These people not only believed that they could make the impossible possible, they believed it was their mission to do so.

Ancient history is enough

What are some of the innovations that combine modern creative design with technological progress that will be remembered for the next 1,000 years or more?

The landing of man on the moon is a good example, and the safe return to Earth.

Let's talk about giant leaps. It's hard to imagine a moment of greater transformation in human history than leaving the world we're in and stepping into another world.

What comes after the moon landing

It's tempting to say that today's pantheon is the Internet.

Internet is not a pantheon

It's like the invention of concrete, important and essential to building and maintaining the pantheon, but it's not enough on its own.

In the same way that concrete technology was essential to the Pantheon's realization, emerging designers will use Internet technology to create new concepts that stand the test of time.

Smartphones are a perfect example

It will soon be owned by the majority of people on Earth, and the idea of ​​connecting people, both in terms of knowledge and relationships, will persist.

what happens next

equivalent to Pantheon

Think about impending advances. I deny many improbable dramatic breakthroughs, like cancer treatments.

Because the Pantheon is, and will always be, a designed physical object that can be stimulated simply by seeing and experiencing it.

it's a different kind of language, like art

The irreplaceable contributions that extend life and relieve suffering are important and wonderful, but they, like the Internet, are part of the continuum of our entire knowledge and technology.

what comes next

Perhaps counterintuitively, I think it's a visionary idea that originated in the late 1930s, and it's something that comes once every decade with a revival: self-driving cars.

You might tell me to stop joking

A high-end version of an automatic speed controller can't be important.

Think about it, our world is designed around roads and transportation.

America's prosperous and developed highway network is equivalent to the roads and transportation that made the Roman Empire successful.

These roads that connect our world today are filled with cars and trucks, and for 100 years, not much has changed here.

Even if it's not obvious today, self-driving cars will be a key technology that will redesign cities and, by extension, redesign civilization.

Because once self-driving cars become mainstream, it could save tens of thousands of lives each year in the United States alone, millions globally.

Automobile energy consumption and air pollution can be dramatically reduced

Most of the congestion can be eliminated

It presents a new concept of how we should design, work and live in our cities.

We will be able to move faster, and society will regain the enormous productivity lost to traffic jams.

But why now

It's been doing this for over 30 years, spending countless millions of dollars by people outside the auto industry building the miracles they need, but for a completely different purpose.

DARPA, the U.S. Department of Defense, universities, and companies that aren't in the automotive industry at all have realized that even today, if they do it smartly, self-driving cars are possible.

What are the five miracles required for self-driving cars?

First, you need to know where you are and the exact time.

This was solved by the GPS system, the Global Positioning System, implemented by the U.S. government.

map information and traffic rules and need to know where you are heading

Web-Based Maps Meet the Needs of Personal and In-Vehicle Navigation Systems

Near field communication requires high-performance computer networks and communication with other nearby vehicles.

Wireless technology was developed for mobile devices, and while it needed some refinement, it did a great job of solving this problem.

For practical use, it's probably better to start with dedicated lanes and let society and the lawyers agree on safety.

This is probably going to start with the carpool lane and go from there.

But eventually we also need to recognize pedestrians, signs, objects,

Machine vision, specialized sensors, and high-performance computing would help a lot, but it's still not enough for home use.

Sometimes a human will have to decide

To do this, you might have to wake up your passenger and ask them what the big obstacle in the middle of the road is.

It's not a bad thing that it still has a role to play in the world of autonomous driving.

By the way, if the first driver tells the confused second driver that the giant chicken at the fork is actually a restaurant, and it's okay to keep going, then all the following drivers can learn that.

When most of the five miracles come true, all we have to do is imagine a better world filled with seductively beautiful, new and functionally designed automated vehicles, and all the money and hard work it takes to buy them home.

The first things will start happening in the next few years, and I predict that automated vehicles will change the world forever in the next few decades.

In conclusion, I've come to believe that the elements of the next pantheon are all around us. It's just waiting for the visionary, the one with the breadth of knowledge, the multidisciplinary skills, and the intense passion to use them to make their dreams come true.

But people like this don't come naturally.

Such people need to be nurtured and encouraged from an early age.

You have to love those people and help them find their passion.

You have to encourage them to work hard and make them understand that failure is the recipe for success, and so is perseverance.

We need to help them find role models, so they can trust themselves and believe that anything is possible, just like my grandfather took me out to buy concessions, just like my parents took me to a science museum.

But there's a caveat: we have to regularly wean them away from the modern wonders of computers, phones, tablets, games, TVs, bring them out into the sun, and let them experience that both nature and design are wonderful things in this world, this planet, this civilization.

Otherwise they won't realize how precious they are because one day they will be responsible for protecting and improving them.

We also need to make them understand a point that often seems to go unappreciated in an increasingly tech-dependent world: art and design are not luxuries, nor are they incompatible with science and engineering.

They're actually essential to what makes us special.

Someday, if you have the chance, take your child to the real Pantheon. We also want to let our daughter, Kira, experience first-hand the power of amazing design, just as one extraordinary day in Rome changed the course of my life after 2000 years.

thank you

(applause)

Remember what the web was like in its first decade? it was fixed

You could connect to the internet and see the site, but at the time it was an organization that had a department for that, and at that time it was an organization that had a department for that, and it was started by individuals who were computer savvy.

With the advent of social media and social networks in the early 2000s, the web has undergone such a transformation that now the majority of the content we see is YouTube videos, blogs, product reviews and social media posts by regular users.

It's also becoming a place where people interact with each other, commenting, sharing information, not just looking at information.

Facebook is the largest, if not the only, place like this. Facebook is the largest, if not the only, place like this. Look at the numbers.

Facebook has 1.2 billion monthly users.

So half of the internet population on the planet uses Facebook.

It's a site where, like any other site, you can create an online persona with little or no IT skills, and people have posted a ton of personal information.

The result is behavioral patterns, preferences and demographic data for hundreds of millions of people, something that has never happened before.

For a computer scientist like me, this means a lot, because I've been able to build models from the information that people share that can predict many hidden traits that people don't know they're exposing.

Scientists can use it to help people interact online, but there are also less altruistic applications. The problem is that users don't understand how this technology exists and how it works, and even if they do, they have no control over it.

What I want to talk to you about today is what we can do about this and the idea of ​​taking some control back into our hands.

This is the logo of a company called Target

I didn't just put a logo on this poor pregnant woman's belly for no reason.

You may have seen the story in Forbes magazine, where Target sent out ads and coupons for bottles, diapers, and cribs two weeks before this 15-year-old girl told her parents she was pregnant.

the father was furious

How did Target know that a high school girl was pregnant that even her parents didn't know?

What it turns out is that they have hundreds of thousands of customer purchase history data, and they've calculated what they call a pregnancy score, not just to determine pregnancy, but even to estimate a due date.

We make inferences from the obvious purchases -- not just the crib or the baby clothes, for example, the crib or the baby clothes, but the fact that you bought more vitamins than usual, or the big tote bag you might need to put your diapers in.

It doesn't seem like you're going to find out anything about each item just because you bought it, but when you compare those patterns of buying behavior with data from thousands of other people, it makes sense.

This is how we -- through social media -- analyze you.

We're trying to find out a lot from these little patterns of behavior of millions of people.

In my lab, with my colleagues, we've developed methods to accurately predict a variety of things: a person's political disposition, their personality, their gender, their sexual orientation, their religion, their age, their intelligence, as well as how much they trust people they know and how deeply they relate to them.

it went pretty well

Again, non-direct information gives results. Again, non-direct information gives results.

One of my favorite examples is this year's paper in the Proceedings of the National Academy of Sciences, if you google it, you'll find it.

If you google this year's paper, you'll find it.

It's a 4-page paper, ready to read

What we're doing here is using just what you've liked on Facebook to predict these individual traits.

In this paper, I've listed five likes that are associated with high intelligence and high relevance.

One of them is the Curly Fries page. (Laughter) Curly Fries are delicious, but liking Curly Fries doesn't mean you're above average intelligent.

So how come this is a highly relevant metric of intelligence when it's irrelevant to what the object is trying to predict? Why is this a highly relevant metric of intelligence?

It turns out that to explain this, we have to look at all the different theories behind it.

One of these is what sociology calls "kinship," and that people are basically like-minded people.

It's a theory established hundreds of years ago that smart people tend to associate with smart people, and young people gather with young people.

We know very well how information spreads through networks.

Information like trending videos and Facebook likes spreads through social networks like a disease.

This has been studied for many years

have a good predictive model

Taken together, it's easy to see why such predictions are made.

So I'm going to hypothesize that either the person who created the page or one of the early "likes" was a highly intelligent person.

And they liked it, and their friends saw this, and they called friends -- and I'm sure he's got a lot of smart friends. So the circle of friends grew, and they liked them, and so on. It came to represent high intelligence.

It's a very complicated relationship, isn't it?

It's hard to explain this in front of normal people, and even then, normal people don't know what to do, do they?

How do you know that when you like something, you're grabbing a personality that has nothing to do with it?

There are many mechanisms where the user has no control over how the data is used.

and i know there's a real problem

I think there are two ways to give users control over how they use their data.

An example I often give is if I get bored of my professorship and start a company, I'll predict your traits, your teamwork skills, your drug addiction, your alcoholism, and so on.

I know how to estimate

And then sell your report to recruitment agencies and big companies that want to hire you.

we can do it soon

You could start a business tomorrow, and there's nothing stopping me from doing that with your data.

I'm saying that's the problem

One of the possible measures is through policies and laws.

In some ways, this may be the most effective, but the problem is that we can only work.

If you look at the policy-making process, you've seen a lot of legislators come together to listen to us, understand what we're talking about, and radically change America's intellectual property laws to give users more control over how their data is used.

doesn't seem very likely

There's also the policy path, where social media companies say, "Your data belongs to you.

You can control everything.”

The problem lies in the revenue model. Social media companies rely on sharing or using your data in some way.

It's sometimes said that for Facebook, "users are the product, not the customer."

So why would a company like this make concessions, such as returning a prized asset to its users?

I think it's possible, but I don't think it's going to happen any time soon.

Another route, which may be more effective, is to use science.

To study the science that has allowed us to develop mechanisms for deriving personal traits from data.

A study very similar to that could develop a mechanism to warn the user, "This is risky."

When you "liked" us on Facebook and shared personal information about us, it increased the accuracy of our predictions about things like whether you were doing drugs or whether you were doing well at work.

If you put in a warning mechanism, you're going to influence people's choices about sharing information publicly, limiting it to their friends, or not sharing it at all.

Or you could consider encrypting the information you upload, so that it's meaningless to sites like Facebook and the third party services that receive data from them, but it can be seen by anyone you want to see it.

This is a very interesting study from an intellectual point of view, and one that scientists would love to do.

In that regard, it's better than policy-making.

When I talk about this, what people often point out is that if everyone starts to keep information private, the methods that we've developed to predict human behavior patterns won't work.

Yes, but for me, it's a success, because as a scientist, my goal is not to extract anything from users' information, but to improve how people interact online.

So sometimes we make inferences from people's data, but if you don't want us to use your data, I think you should have the right to say so.

I think users should be informed and consented to use the tools we develop.

By promoting scientific research and supporting researchers to give users some of the power to manage their data from social media, tools like these will evolve and progress, and users will have the knowledge and the power.

Thank you very much

(applause)

My job at Twitter is to ensure users' trust, protect their rights, and keep them safe from other users, and sometimes from themselves.

Let's see what the scale of Twitter looks like.

Over 2 million tweets per day in January 2009 Over 2 million tweets per day

In January 2014, there were over 500 million tweets per day.

2 million tweets in less than 6 minutes

24,900% increase

The majority of activity on Twitter does not endanger anyone The majority of activity on Twitter does not endanger anyone

no risk

My job is to eliminate and prevent potentially dangerous activities.

Sounds simple, right?

It sounds easy, because the vast majority of activity on Twitter is harmless.

So why do we spend so much time looking for potential hazards in this benign activity?

Given the size of Twitter, the one in a million chance is happening 500 times a day.

This is the same for other companies of this scale. This is the same for other companies of this scale.

The rare cases that are unlikely to happen to us happen on a daily basis.

99.999% of tweets are in danger

let's say it wasn't

Maybe they're documenting their travels in places like Australia's Heart Reef, tweeting about concerts they're attending, or showing them pictures of cute baby animals.

After removing that 99.999%, the very few tweets that remain are roughly 150,000 per month.

The sheer scale of what we're dealing with creates a challenge.

Do you know what is the other thing that makes my job harder?

Humans do weird things

(Laughter) You have to figure out what they're doing and why they're doing it, and if there's danger in it, without much context or context.

Let me share with you some examples that I've come across while working on Twitter, all of which are real-life examples of seemingly mundane situations, but the truth is quite different.

Details may be innocent or guilty, but changed to protect privacy.

Let's go because it's easy

[“Yo bitch” (Oh female dog)] If you only saw this tweet, you would think it was a curse word

Who would want to receive a message saying "oh bitch"

I try to stay abreast of the latest trends and memes, so I know that "Yo bitch" can be used as a greeting between friends, or it can be a quote from the hit show "Breaking Bad."

But this fourth usage was honestly not what I expected.

This is what is used on Twitter when pretending to be a dog when talking.

["Yo bitch"] (Laughter) In this case, not only is it not a curse word, but it's actually the right greeting for the situation.

(Laughter) It's hard to tell without context whether a word is abusive.

Consider Spam

This is typical spammer behavior This is typical spammer behavior Sending the exact same message to thousands of people Sending the exact same message to thousands of people

This is what I've replicated on my own account, but I see things like this all the time.

It's very easy to understand

Accounts doing this should be automatically closed

But it turns out that there are exceptions

It could be a service that reminds you to get out and see the International Space Station with messages like that passing overhead.

If you consider this as spam and close your account, everyone will miss the space station.

Consider a more serious case

Again, on my account, I mimicked typical problem behavior.

It's sending multiple identical messages with links.

This is commonly seen in what's called phishing, where people try to steal your account information by redirecting you to another site.

that's obviously not good

I'd like to suspend accounts that engage in this kind of activity, and I've actually suspended them.

So why is this important?

Perhaps this is an eyewitness recording of a police officer beating an unsuspecting protester and trying to tell the world about it.

I don't want to risk blocking important speech by classifying it as spam.

So when we look at account activity, we use hundreds of scales, and yet sometimes we can be wrong and need to double check.

Given the kinds of challenges I face, it's important not only to anticipate disaster, but to have mechanisms in place to protect against the unexpected.

This isn't just a problem for me or Twitter, it's a problem for everyone.

It's a problem for anyone trying to build something great that will enable everyone to do great things.

So what do we do?

I stop and think, "What if something really bad was going to happen, how would I do it?"

imagine a disaster

This is difficult. There is a kind of cognitive dissonance, like trying to make a prenuptial agreement at the same time as saying your wedding vows.

(Laughter) But you have to, if you decide to marry 500 million tweets a day.

envisioning a disaster

It means thinking about how harmless things like pictures of cats can lead to people's death, and how we can prevent it.

The following case is just such an example.

this is my cat eli

We wanted to be able to attach photos to tweets

Seeing is believing

In a tweet of just 140 characters

How rich would it be if you added a photo?

There are so many great things that you can do with photos in your tweets.

But it's not my job to think about it

It's my job to think about how it can go wrong.

How could this photo lead to my death?

For example, there is a possibility that

Cats aren't the only ones in this photo.

Has GPS information

When you take a picture with your cell phone or digital camera, there's a lot of information that's stored with the image when you take the picture, and it's stored with the image.

This image contains information equivalent to this, and more specifically this location information.

I don't think anyone would want to locate me and do something wrong with the information that came with my cat photos, but I would start by assuming that the worst would happen.

That's why when we allow photos to be attached to tweets, the GPS information is stripped out.

(Applause) By always assuming the worst and being conservative, we can ensure that the protections we create work in both the expected and the unexpected ways.

If I spend all my time imagining the worst that could happen, it's no surprise that my view of the world becomes bleak.

(Laughter) But it's not.

The vast majority of the interactions that I see, I've seen a lot of them, and they're positive.

It's just that those of us who work at scale and whose job it is to keep people safe are forced to assume that the worst is going to happen, because for us, the one-in-a-million chance is very likely to happen.

thank you

(applause)

By observing nature through the magnifying glass of science, designers learn the principles and processes and materials that underlie their design systems.

Nature is evolving design, from artificial constructs that mimic biological materials to computational methods that mimic neural processes.

At the same time, design is also evolving nature.

In the fields of genetics, regenerative medicine, and synthetic biology, designers are creating completely new technologies that were not anticipated by nature.

Bionics is the intersection of biology and design

Exploring interactions As you can see, my leg is a bionic prosthesis.

Today, I'm going to talk to you about the fusion of humans and bionic technology, and how electronic controllers that are attached to the body or implanted in the body are beginning to bridge the gap between the disabled and the able-bodied, the gap between the disabled and the able-bodied, the gap between human limitations and possibilities.

bionics define my body

In 1982, I lost both of my legs to tissue damage from frostbite in a mountaineering accident.

At that time, I didn't see my body as broken.

I thought that the human body could never break down.

It's the technology that's broken

technology was inadequate

This simple and powerful idea motivated me to set my mind on advancing technology to eliminate my disability and the disability of others.

I started by developing a special prosthetic leg that would allow me to return to the vertical world of rock and ice climbing.

What I quickly discovered was that my artificial body parts could have any form or function that I wanted, a blank slate, a blank slate, an ability to create structures that functioned beyond biological limits.

I tried to make the height adjustable

You can go as low as 150cm or as high as you like.

(Laughter) When I'm feeling down or feeling insecure, I try to grow taller.

When I felt confident and relaxed, I would try to be a little shorter to give my opponent a handicap.

(Laughter) (Applause) With my narrow, wedge-shaped feet, I was able to climb steep cracks in rock where I would not normally be able to gain footing, and with my spiked feet, I was able to climb vertical ice walls without muscle fatigue.

Technological innovation has made me come back to my sport stronger.

Technology has removed my barriers and given me new climbing abilities.

When I was young, in the future, technological advances would realize a world without disabilities, and nerve transplants would restore sight to the visually impaired.

I imagined a world where a paralyzed person could wear an exoskeleton and walk again.

Unfortunately, due to the immaturity of technology, disability is prevalent in the world.

This man has lost three limbs

Today's technology frees us from wheelchairs, but one day we'll have to advance bionics even further so that people with severe disabilities like him can fully overcome their limitations.

At the MIT Media Lab, we established the Extreme Bionics Center.

Our mission is to promote basic scientific research and technological capabilities to repair various brain and body dysfunctions through biomechanical engineering and regenerative functions.

Today, as a good example of what this center is doing, I'm going to show you how my legs work.

I shaved my legs properly last night, so I'll show you guys

Bionics involves advanced interface engineering

My bionic limb uses three interfaces: mechanical, how it attaches to my body; dynamic, how it behaves like a living leg; and electrical, the technology that communicates with my nervous system.

I'll start with the mechanical interface.

In the realm of design, we still can't really attach devices to our bodies.

It's hard to believe that in this day and age, one of the most mature and oldest technologies in human history, the shoe, still causes blisters.

Why?

We have no idea how to successfully attach things to the human body.

This is a beautiful and lyrical design piece by Professor Neri Oxman of the MIT Media Lab, a 3D printed model of the exoskeleton's resistance to different locations in different colors.

Imagine a futuristic garment with varying stiffness depending on the location and situation, providing optimal support and flexibility while always being comfortable.

My bionic prosthesis is attached to my body with an artificial skin material whose stiffness changes in response to the biomechanics of the tissue in which it is attached.

To enable this correspondence, I first created a mathematical model of my leg. First, I created a mathematical model of my leg.

To do this, we used imaging tools such as MRIs to get images of the inside of the body to understand the shape and location of different tissues.

We also used a robotic tool, a circle with 14 actuators that went around the leg.

The actuator extends to find the surface of the leg, measure its uncompressed shape, then push the tissue and measure the compliance of the tissue at each point on the leg.

And I've combined the data from these images and robots to create a mathematical representation of my lower extremity, like the one on the left.

A number of points on the screen are called nodes.

The color of each node represents organizational flexibility

I'm going to convert this mathematically and use it to design artificial skin like the one on the right.

And we found that the best fit was soft synthetic skin on hard parts of the body, and hard synthetic skin on soft parts, and this combination was found in every tissue.

Based on this framework, I've created the most comfortable bionic prosthesis I've ever tried.

Clearly, in the future, the design and manufacture of our clothing, shoes, orthotics, and prosthetic limbs will move from artisanal work to a data-driven, mathematical approach.

In the future, you won't get blisters from wearing shoes.

We've embedded sensors and smart materials into artificial skin.

This is a material developed by SRI International in California.

Hardness changes due to electrostatic effect

At zero voltage, the material becomes soft and paper-like.

But when you push a button and apply voltage, it hardens like a board.

We've embedded this material into the artificial skin that connects my body to the bionic limb.

When you're walking like this, there's no voltage applied.

This interface is soft and flexible

When the button is pressed and the voltage is applied, it stiffens, allowing more freedom of manipulation of the bionic limb.

We also make wearable exoskeletons.

This exoskeleton (exoskeleton) protects a person's joints from impact and wear by hardening and softening in the necessary parts while running.

In the future, we'll all be wearing exoskeletons and doing exercises like running.

Then the dynamic interface

Why does my bionic prosthesis move like a real leg?

In my lab at MIT, we study how people normally stand, walk, and run.

How do muscles move, and how does the spinal cord control them?

This basic science is the foundation of what we want to build.

Bionic ankles, knees, hip joints, etc.

I'm trying to create body parts from scratch.

The bionic prosthesis I'm wearing is called BiOM.

So far, it's been fitted to nearly 1,000 patients, 400 of whom are wounded US soldiers.

This mechanism is controlled by a computer when the heel touches the ground.

The system controls the hardness and softens the impact of the prosthesis on the ground.

During the walking motion, the increased torque and power from the prosthetic limb push the body up and forward, much like the muscles around the calf.

This bionic propulsion is actually very important for patients.

The woman on the left is wearing a bionic device, and the passive device worn by the same woman on the right fails to mimic normal muscle function, which allows us to do things that anyone would normally be able to do, like climbing stairs at home.

Bionic prostheses also allow for amazing movements.

This is a man running on rocks

His name is Steve Martin, not the comedian of the same name.

We also use the same principle to create exoskeletons that wrap around your legs.

This man has no leg problems or disabilities.

It's a healthy body. This type of exoskeleton gives your legs muscle-like torque and power, so you don't have to produce them with your own muscles.

This is the first ever exoskeleton that enhances walking.

Significantly reduces metabolic cost

Because of its potent augmentation power, if a normal, healthy person wears the device for 40 minutes, when it is removed, the real leg feels ridiculously heavy and awkward.

We are at the beginning of an era where machines on our bodies will make us stronger, faster and more efficient.

Next is the electrical interface. How does my prosthetic limb communicate with my nervous system?

Attached to my remaining lower extremity are electrodes that measure the electrical pulses emitted by the muscles.

When I think about this pulse going to the bionic prosthetic limb and moving the lower limb that I don't have, the robot obeys that desire to move.

This diagram basically describes how the bionic prosthesis is controlled.

We've modeled the missing limbs to understand what reflexes are and how spinal reflexes control muscles.

We've embedded that functionality into a bionic prosthetic chip.

So, how it actually works, I adjusted the sensitivity of the reflexes to match the spinal reflexes and nerve signals in the model, so that if I relaxed the remaining leg muscles, the torque and power would be very low, and if I tightened the muscles, I could get more torque, and I could even run.

This was the first demonstration of neural command running.

i feel great

(Applause) And even

We want to connect the interaction between humans and prosthetic limbs in both directions.

I'm experimenting with growing excised nerves through microchannel arrays.

On the other side of the channel, nerves connect to cells like skin cells and muscle cells.

Because if you look at the movement channel, you can see how people want to move.

We can then wirelessly transmit that to the bionic limb, or convert the signal on the sensor side of the bionic limb into a stimulus and pass it on to an adjacent sensory channel.

If this can be developed for human use, people like me will not only have prosthetic limbs that move as realistically as real legs, but they can also have realistic sensations.

In this video, you can see Lisa Mallett right after she got prostheses in both legs.

Bionics is certainly making a big difference in people's lives.

(Video) Lisa Mallett: Oh

I can't believe it.

It looks like it has real feet!

Woman: don't run

Man: Turn around and do the same thing while climbing Walk, heel to toe, just like you would when walking on flat ground.

go up the slope

Lisa: Oh I can't believe it

Man: Do you push yourself up?

Lisa: Yes! No more - there's no analogy

Man: You're pushing it up properly.

Next week I -- (Applause) Thank you.

thank you next week i

I'm going to go visit Medicare and Medicaid and the Centers for Service (CMS) and try to convince them to set the right codes and prices so that this prosthesis can reach the patients who need it.

Thank you. (Applause)

Little is known, but more than half of the world's population suffers from some form of cognitive, emotional, sensory, or motor dysfunction, and all too often, due to poor technology, such conditions lead to disability and reduced quality of life.

A basic level of bodily function should be guaranteed as part of human rights.

Every person should have the right to live a life free of disability if they wish -- the right to live free from severe depression, the blind person's right to see their loved ones, the paralyzed or amputated person's right to walk and dance.

Societies as a whole should be able to realize these human rights if we accept the idea that humans don't have disabilities.

people never break

The environments and technologies that we created are broken and not working.

We humans don't have to accept our limitations, we can overcome obstacles through technological innovation.

Through this century's advances in bionic technology, we will establish the technology for a higher human experience and the eradication of disability.

I would like to conclude with another story, a beautiful story.

The story of Adrian Haslet-Davis

Adrian lost his left leg in the Boston attacks.

This is a picture of when I met her at Spalding Rehabilitation Hospital.

Adrian is a ballroom dancer.

Adrian lives in the world of dance

Dance is her expression, her art form.

Naturally, when she lost her leg in the Boston attacks, she wanted to get back on the dance floor.

After seeing her, I was driving home, and I thought, I'm a professor at MIT.

Now that we have the resources, let's build a bionic prosthesis so she can get back to dancing.

I brought together a group of MIT scientists who specialize in prosthetics, robotics, machine learning and biomechanics, and spent 200 days studying dance.

We took dancers, studied how they moved, what forces they exerted on the dance floor, and collected that data, and from there we worked out basic dance principles, reflexive dance abilities, and so on, and we embedded that intelligence into bionic prosthetic limbs.

Bionics doesn't just make people stronger and faster

Emotional expression and humanity can also be incorporated into robotics.

In 3.5 seconds, two bombs were fired in Boston

Exploded in 3.5 seconds Criminal Coward took the dance floor from Adrian

We spent 200 days getting her back there.

We will not be frightened, succumbed, disrespected, conquered and stopped by threats of violence.

(Applause) Ladies and gentlemen, I'd like to introduce you to Adrian Haslet-Davis, his first performance since the murder.

dance with christian lightner

(Applause) (Music by Enrique Iglesias, "Ring My Bell") (Applause) Ladies and Gentlemen, members of the research team, Elliott Rouse and Nathan Villagale Karski.

Elliott and Nathan

(applause)

Ladies and gentlemen, we're going to sing the history of Internet music and television in three minutes.

Ted Medley is abbreviated as "Tedley"

♫ 9:00 p.m. Saturday ♫ ♫ The record stores are closed ♫ ♫ I open up the iTunes music store ♫ ♫ I feel good in no time ♫ ♫ Steve Jobs finds the perfect song for me ♫ ♫ $1 is awesome ♫But Steve wants to rule it all♫ ♫Desperate Housewives was funny last night♫ ♫I ate rotten cod♫ ♫I threw up my meal but it's not that big of a deal♫ ♫You'll see it on your iPod tonight♫ ♫Every network is on now♫ ♫2 dollars an episode no commercials♫ ♫This is the business they've always wanted to do♫ ♫But only Steve Jobs had the guts♫ I don't watch it ♫ ♫ You say you only watch the internet ♫ ♫ That's not true ♫ ♫ See, the show we're watching is only two minutes ♫ ♫ Hey ♫ ♫ There's YouTube ♫ ♫ There's YouTube ♫ ♫ Now everyone ♫ ♫ A song for the Recording Industry Association of America ♫ ♫ It's the RIAA ♫

♫ Young man you're surfing the internet ♫ ♫ And young man you download a song ♫ ♫ And dumb man you copy it to your iPod ♫ ♫ Then you get a phone call ♫ ♫ You've been sued by the RIAA now ♫ ♫ You're being ripped off by the RIAA ♫ ♫ Lawyers call you a criminal ♫ ♫ You're exploiting a band ♫ ♫ You're learning to steal ♫ ♫ You can't do whatever you want ♫ ♫ CD sales are dropping every year ♫ ♫ They're not greedy They're just scared ♫ ♫ All our customers go to jail ♫ ♫ Who will the RIAA catch next? ♫ ♫ What else pisses off the RIAA? ♫ ♫ Is it a whistle? ♫ ♫ Maybe humming? ♫ ♫ Or is it a satirical song? ♫

Let's talk about Chip, the poet, and a young man.

Exactly 20 years ago -- in June of 1994, Intel announced that there was a flaw in the core of the Pentium chip.

In the code of the SRT algorithm -- the part that computes the intermediate quotients needed for the iterations of the floating-point division -- I don't really understand it, but that's what Wikipedia says.

According to Intel, a typical spreadsheet goes wrong once in 27,000 years.

Intel didn't take the flaw seriously, but the community was outraged.

Engineers thought they should do something Engineers thought they should do something

They didn't sit around and wait for a tip change They didn't sit around and wait for a tip swap

revolutionized the world

People marched demanding replacements -- well, not so much, but they stood up demanding flaws to be fixed.

Intel set aside $475 million to replace millions of chips $475 million set aside

So hundreds of millions of dollars of gold was spent on the question of if it happens once in 360 billion times.

the second is a poet

I'm Martin Niemöller

you know his poems

During the height of the Nazis, he used to say a poem, "When they attacked the communists, I didn't speak up because I wasn't a communist.

Socialist next —

Trade unions next —

Next the Jews were attacked

And finally it's my turn

But there was no one left to speak up for me."

Niemöller captures the essence in this poem.

understanding the core essence of intelligence

You can call it a "clue"

It's like a test: Can you spot the hidden dangers and deal with them?

Can you save yourself and your friends?

ants cope well

cows not so much

Can you spot any patterns?

Can we spot patterns, understand them, and take action?

the third is youth

This is my friend Aaron Schwartz.

he is tim's friend

I have many friends among you. Seven years ago, Aaron came to me and asked.

I was right before my first TED talk.

I spoke to him, confidently, about his talk, "The law stifles creativity."

Aaron looked at me and said, a little annoyed, "How the hell are you going to solve that problem?

Copyright policy, internet policy, how are you going to deal with those issues? The system of government is fundamentally corrupt.”

I'm a little tired of this

Because it put a damper on the celebratory mood

So I said, "Aaron, that's not my area of ​​expertise."

He said, "As a scholar, right?"

"Oh, it's not my area of ​​expertise as a scholar."

"So what about being a citizen?

As a citizen? ”

This is how Aaron did it

he asked without saying anything

But his question was as eloquent as a four-year-old's hug.

He used to tell me, "You should find clues.

"We should look for clues, because this democracy's operating system is flawed at its core. But in our democracy, out of 360 billion decisions, you're not just getting it wrong once.

Every time, every time — I get it wrong on every important issue

We must put an end to the stupidity of this political society.

We've got to have the 'ant formation attitude' We've got to have the 'ant formation attitude' I've seen these words on the internet Ants have the power to discern And with that power they can find their flaws and save their people and the people."

If you knew Aaron, you know he passed away about a year ago.

When he passed away, about six weeks before I was at TED, I was so grateful to Chris for asking me.

It was a sadness that cannot be expressed in words.

That's why it's important to focus —

I had to focus on what I was going to say to the audience.

I was saved by it

But once I felt the excitement, the enthusiasm and the power of this community, I felt a strong desire to deal with the issue of corruption in a less sterile, less academic way.

So we started looking at New Hampshire as a campaign target, because the New Hampshire primary is extremely important, because the New Hampshire primary is extremely important.

We organized the New Hampshire Rebels and started looking at how we could make this issue of corruption an issue in the 2016 presidential election.

On the other hand, there was one person who captured my heart, Doris Haddock, aka Granny D.

Fifteen years ago, on January 1, 1999, Granny D, then 88 years old-

I walked from Los Angeles to Washington, D.C.

I had this message in my heart: "Fiscal Reform Campaign."

Eighteen months later, at the age of 90, she arrived in Washington with hundreds of people, many of them lawmakers, and they only drove a mile out of town to walk with her.

(Laughter) I just don't have the time for 13 months across the country.

My three kids hate walking, and I don't know why. My wife hates walking more than my kids, I don't know why.

Even if 5,000 km is impossible, what about 300 km? What about driving across New Hampshire in January?

So we started walking on January 11th, the anniversary of Aaron's death, and finished on January 24th, Granny D's birthday.

A total of 200 people walked from the northernmost point of New Hampshire to the southernmost point, talking about corruption.

To my surprise and surprise, every single person I talked to about this issue was outraged.

According to a survey, 96 percent of Americans believe that money's influence in politics should be undermined.

Politicians and pundits, on the other hand, claim that there is no effective response to corruption and that the public doesn't care.

Between those numbers, 96% and 91%, is our attitude of resignation.

96% of people want to fly like Superman, 96% of people want to fly like Superman, and 91% believe it's impossible.

Because you accept your limitations, and the same goes for this reform.

But if you give people hope, the belief that it's impossible will disappear.

Harvey Milk said, To give hope is to give chance, to think about how to make change happen.

hope···

It was this very hope that we, Aaron's friends, robbed him of, because of us, he lost hope.

I thought of Aaron as my son.

but i let him down

I love my country and I'm not giving up

and i won't give up

Such hope is something that should be held and won, no matter how difficult it may seem.

What next?

The first march was 200 people, and next year we're going to have a 1,000-strong march. In January, we'll march on different routes, and in January, we'll march on different routes, and we'll meet in Concord, the state capital, to spread the word.

While we were marching, we received inquiries from all over the country: "Can we march in our state?" "Can we march in our state?"

So we started a movement called the "Granny D Walkers," whose allies across the country would march for reform.

Also on the march was David Cassino, one of the founders of Thunderclap, who offered to help.

You've developed a platform that you're going public with today. You've developed a platform that you're going public with today.

Whether you're in New Hampshire or not -- whether you're in New Hampshire or not -- when you register, you know where the candidates who are working on this issue are.

And finally there's the toughest challenge

Today is the age of super PACs

Yesterday, Merriam-Webster announced that it would be adding Super PAC to its dictionary.

officially listed in the dictionary.

So we're planning an experiment on May 1st, which is May Day.

We're going to launch a super PAC to stop all super PACs - we're going to launch a super PAC to stop all super PACs

Here's how it works

Over the last year -- I've worked with analysts and political experts to do some cost calculations -- how to get the votes in Congress to make radical reforms -- how to get the votes in Congress to make radical reforms.

How much will it cost? $500 million? Billion dollars?

how many dollars will it be?

But no matter what the dollar amount is, we're going to start crowdfunding. Kickstarter can't be used for political campaigns, but we're going to start by raising money through grassroots campaigns, soliciting small donations, and ultimately aiming to achieve some ambitious goals. On January 8th -- I just realized yesterday that this day would have been Aaron's 30th birthday if he were still alive, but on November 8th, we'll be celebrating the election of 218 Congressmen and 60 Senators -- 218 Representatives and 60 Senators -- who will be subscribed to the idea of ​​radical reform.

Yesterday we heard some wishes

On the other hand, my wish is like this

May 1st —

The ideal of one young man is to unite the nation against the backdrop of the central idea of ​​"one people." The government promised to us is a government that obeys only the people.

It's May 1st

I want you to join this movement, not because you're a politician, not because you're an expert, not because you're an expert, not because you're a citizen, because you're a citizen.

Aaron asked me

Now it's my turn to ask you

thank you

(applause)

The world can distort who we are, but deep inside we know ourselves so well that a question lingers in our hearts: "How can I be myself?"

I may be a little weird in this regard, but I'm not alone, I'm not alone

When I became a fashion model, I realized that I had dreamed of it since I was a little kid.

The me on the outside finally matched the me on the inside - the me on the inside.

For many complicated reasons, which I'll explain later, when I saw this picture, I thought, "Gina, you've finally made it. You've made it this far."

But this October, I realized that I still have a long way to go.

We are all shaped by our families, by our religion, by our society, by the time we were born, and by our bodies.

Some people have the courage to break through it, people who don't accept the limitations imposed by the color of their skin or what other people think of them.

They're always a threat to the status quo, a threat to acceptance.

In my case, for the last nine years, my neighbors, my friends, my colleagues, even my office, didn't know about my past.

In a mystery, is this called solving a riddle?

Here's my puzzle

When I was born, I was identified as a boy by the appearance of my genitals.

I still remember when I was five years old, in the Philippines, walking around the house with a T-shirt on my head all the time.

My mother turned to me and said, "Why do you always have a T-shirt on your head?"

I said, "Mom, this is my hair, I'm a girl."

Back then, I knew how to express my personality.

Gender has always been thought of as an immutable fact, but today we understand it to be more fluid, complex and mysterious.

Because of the success I had, I didn't have the courage to share my story, not because I thought I was wrong, but because I knew what the world would do to those of us who wanted to be free.

Every day I am grateful that I am a woman.

I have a mother and father who accept me for who I am.

There are many people who are underprivileged like this.

Asian cultures have a long tradition of celebrating the mystery of fluid gender.

Buddhism has a goddess of mercy

Hinduism has a transgender hijra goddess.

When I was eight years old, I went to a Filipino festival celebrating these mysteries.

I can still remember that I was standing in front of the stage, and this beautiful woman appeared in front of me.

And when I was 15, still dressed as a boy, I met a woman named T.L.

She was the manager of a transgender beauty pageant.

That night she asked me, "Why aren't you in a beauty pageant?"

She convinced me that if I went, she would take care of the fee and the costume, and that night I won the swimsuit category and the long dress category, and came in second out of over 40 nominees, second out of over 40 nominees.

That moment changed my life

Suddenly, I entered the world of beauty pageants.

Few women can say that their first job was a beauty pageant queen for transgender women, but I will.

Between the ages of 15 and 17, I've participated in everything from top-notch beauty pageants to contests that literally took place in the back of a truck, sometimes on the roadside right next to the rice fields, and when it rained -- it rains a lot in the Philippines -- the organizers would move the venue inside someone's house.

I've also experienced the kindness of strangers, especially while traveling in the remote countryside of the Philippines.

But most importantly, I met my best friends in the community.

In 2001, my mother, who had emigrated to San Francisco, called me and told me that my permanent visa application had been approved and that I could move to the United States.

i resisted

I told my mother, "Mom, this life is fun

I like having friends, traveling and being a beauty pageant queen."

And then, two weeks later, my mom called me and said, "Did you know that if you move to America, you can change your name and your gender?"

that was enough for me

My mother told me to spell my name with two E's.

My mother came to me when I had surgery when I was 19 in Thailand.

Interestingly, some of Thailand's countryside has some of the most prestigious, safe and modern surgeries.

Back then, in America, before you could change your name or your gender, you had to have surgery.

In 2001, when I moved to San Francisco, I remember looking at my California driver's license, and it said my name was Gina, and my gender was F.

it was a very powerful moment

For some people, an ID is for driving and drinking, but for me it's a proof for living -- a proof for feeling dignified.

All of a sudden my fear was minimized.

I followed my dream and moved to New York, thinking I could become a model.

There are many people who are not blessed like this.

Reminds me of a woman named Ira Nettles

She was a young woman from New York who had the courage to live her true self, but hatred killed her.

For many people in my community, this is the reality we live in.

Our suicide rate is nine times higher than other people's.

Every year on November 20th, Transgender Remembrance Day is celebrated as an international day of remembrance.

I stand on this stage because of a long history of people who have stood up and fought against injustice.

Marsha P. Johnson and Sylvia Rivera.

Today, this very moment is my true coming out.

I can no longer live my truth just for me

I want to do all I can to help other people live their truth without shame or fear.

I am here in front of you, so that the remembrance of November 20th will never again be needed.

My inner truth allowed me to accept myself for who I am.

Will you accept me?

thank you very much

(Applause) Thank you, thank you, thank you. (Applause) Kathryn Schultz: Gina, let me just ask you one question.

What would you say -- especially to a parent, or more broadly, to a friend or family member who meets a child or adult who feels conflicted and uncomfortable about their assigned gender -- what would you say to that person's family so that you can treat them as caring, caring family members?

Rocero: Yeah, well, first of all, I'm really blessed.

It's a support system, especially with my mother and my family.

Every time I coach young transgender women, I coach them -- sometimes they call me and say that their parents won't accept me.

Sometimes it works, sometimes it doesn't work, but gender identity is at the core of who we are, isn't it?

I mean, everyone is given a gender at birth, but what I'm trying to do is have a dialogue when the assigned gender doesn't match -- and create space for people to express themselves. That's the kind of dialogue we should have with our parents and our colleagues.

The transgender movement is just getting started compared to how the gay movement started.

There are still many issues to be addressed

I need to understand

I need space to pique your interest and ask questions, and I hope you can stand by me.

Schultz: Thank you. It was great. Rocero: Thank you.

(applause)

hello?

yes it's me

eh?

yes yes yes yes of course

When was it?

pen take the pen

March 17th to 21st

ok thank you very much

from who?

It's TED

Who is Ted?

I have to prepare

Musical "Let's Talk" (music) [My talk] ♪ Procrastination~ ♪ What do you think?

(chime) Who are you?

(music) ♪ Get ready for the main stage at TED ♪ ♪ It's your time to shine ♪ ♪ The secret to success is ♪ ♪ Listen carefully and prepare ♪ ♪ The slides aren't great ♪ ♪ I have a good idea ♪ ♪ Don't worry ♪ ♪ I'll make sure you have a great TED talk ♪ ♪ I know about climate change ♪ ♪ Anything new? ♪ ♪ Narrow down your theme ♪ ♪ Your talk will be clear ♪ ♪ On stage ♪ ♪ No business ♪ ♪ You won't be able to post it online ♪ ♪ We'll make it possible for you to give a nice TED talk ♪ (music) Shall we practice again?

from now?

go for it

♪ I think I'm forgetting something ♪ ♪ Does the remote really work? ♪ ♪ Why am I next to Al Gore? ♪ ♪ I'm scared to death ♪ ♪ I don't want to pass out on stage ♪ ♪ I shouldn't have worn a green dress ♪ ♪ Let's start talking ♪ ♪ Look good like Brené Brown ♪ ♪ You're running out of time The clock is pointing to zero ♪ ♪ You're talking fast, but I hope everyone gets it ♪ ♪ I'm too nervous to talk ♪ ♪ Don't give up Practice, you can do it ♪ ♪ I'll edit it if you make a mistake ♪ ♪ Let's start talking ♪ ♪ Be strong like Amy Cuddy ♪ ♪ Be charming like Hans Rosling ♪ ♪ Then release the mosquitoes ♪ ♪ Like Bill Gates ♪ ♪ I'll make you have a great TED Talk ♪ ♪ I'll make you a great TED Talk ♪ ♪ I'll make you a great TED Talk ♪ ♪ I'll make you a great TED Talk ♪ ♪ I'll make you a great TED Talk ♪ (Applause) With the TED staff. Sent by my friends (music)

If you look at the night sky, you can see the stars.If you look farther away, you will see more stars.If you look farther away, you will see galaxies.

If you look farther and farther, there's nothing for a while, and then you see a faint, fading afterglow, the afterglow of the Big Bang.

At the moment of the big bang - in the earliest universe, everything we see in the sky tonight was a terrifyingly small, condensed, ultra-dense, ultra-hot, hot ball of fire that started everything around us.

Now, the afterglow has been mapped very precisely. Now the afterglow has been mapped very precisely.

Afterglow is measured in rigorous detail, and one of the surprising results is that it's 14 billion light-years square and almost perfectly homogeneous.

14 billion light-years square, almost completely homogeneous, 14 billion light-years square, almost completely homogeneous, same temperature.

Now, 14 billion years after the big bang Now, 14 billion years after the big bang It's getting a little colder

absolute temperature is 2.7 degrees

Not exactly 2.7K

There is about 1/100,000 unevenness There is about 1/100,000 unevenness

Some places are a little hotter, some places are a little colder, and this means a lot to all of you here, because there's something in the hot place, and where there's something, galaxies and clusters and superclusters and everything you see in the universe.

These small inhomogeneities that exist at a rate of 1 in 50,000 are present at a rate of 1 in 50,000. These small inhomogeneities were created by quantum fluctuations that spread throughout the universe in the early universe.

It's epic, but the discovery of March 17th is much cooler than that.

This is it, think of a bell, when you strike a bell with a hammer

what happens? I hear a sound

After a while, the sound fades away and becomes inaudible.

The early universe was so dense, so much denser than metal, that it would make a sound if you hit it. The thing that makes the sound is the structure of space-time itself, and the hammer is quantum mechanics.

The discovery on March 17 proves that space-time rumbles in the early universe, called "gravitational waves," and they're from the primordial age of the universe.

Because gravitational waves have long since weakened.

We don't tremble when we go out for a walk

In the fabric of the universe, gravitational waves are virtually negligible.

But in the early days, when the universe was still emitting its final afterglow, gravitational waves left faint patterns in the structure of the light we see.

This research team looked at the night sky -- in fact, spent three years in Antarctica, in cold, clear air like nowhere else, in cold, clear air like nowhere else, looking up at the sky, observing that afterglow, the faint pattern of gravitational wave signals -- finding the sounds of the early universe, finding the sounds of the early universe.

On March 17th, we announced this discovery.

What's amazing about this is the wave from the big bang -- not only is it amazing, but of course it's --

And what's really cool is that I'm here today to say this -- and this has deep implications for the early universe.

So what this shows us is that our universe is like one big bubble, and that's the theory of inflation. It's a big bubble surrounded by something.

It's not definitive proof, but if you try to explain this outside of inflation, you'll end up with the same thing.

This was a theory, an idea for a long time, and this was a theory, an idea for a long time, and it was thought that gravitational waves would never be detected.

I didn't expect to see such strong evidence.I didn't expect to see such strong evidence.

The incredible thing is, our universe is just a bubble in a swirl of things. Our universe is just a bubble in a swirl of things.

Even if we don't see anything but our own universe, living in Antarctica for three years and observing the structure of the night sky in detail, we realize that we are in that universe, that we are in that universe.

really amazed

thank you

(applause)

Chris Anderson: This time it's going to be a different interview.

They say that a picture is worth a thousand words, so what I asked Bill and Melinda to do was pull out a picture that would explain what they'd been doing, and then we'd talk about it.

It's from this photo

Melinda, when was this and where is it? Who is that handsome man next door?

Melinda Gates: The one with the big glasses?

This is Africa. It was the fall of 1993 when we both first visited Africa.

already engaged

We got married a few months later, and on this trip we got to see the animals and the savannah.

It was great. Bill had never taken a long vacation before.

But what really moved me was the local people, who were living in extreme poverty.

we started asking ourselves

"Is this okay?"

Towards the end of our trip, we went to Zanzibar and strolled along the coast, which I used to do a lot when we were dating.

We've been talking for some time about how we'll eventually give back to society the wealth that Microsoft brings, but it was exactly this walk on the beach that we started talking about what and how.

So this vacation led to the creation of the world's largest private foundation, which was expensive for a vacation.

Which idea was it? Or neither?

Bill Gates: Well, there was something in our lives that we could work on together, and we were both excited to see how we could get our wealth back.

At this point, we were talking about the poorest people. Can we make a big impact on them?

Are there things left untouched?

There were many things I didn't know

Looking back, our thoughts at the time were surprisingly sweet

But I had a kind of passion, and that was the next phase of my post-Microsoft life, doing philanthropic work.

I assumed that Bill would be over 60, but he's not yet 60, so some things have changed.

It started from there and progressed rapidly.

It all started in '93 and then in '97 -- before the foundation started working, right?

Well, in 1997, I read an article about how many children in the world were dying of diarrhea, and I kept saying, "It can't be that way.

In the US, just go to a pharmacy."

So we got scientists together and learned about demographic data and vaccines and what worked and what didn't, and that's when we started working in late 1998 and early 1999.

You two had a lot of money, but the world was full of problems.

How the hell did you focus?

So we decided to pick two themes. Anyway, among the worst inequalities in the world, we chose countries that are dying, children who are undernourished and unable to thrive, countries that are stranded. Mortality is high, parents are having too many children, so there is population explosion, children are sick, they are not getting a decent education, and they have no hope for the future.

This was the first. On the other hand, in the United States, we were both well educated, and the United States can guarantee equal opportunity.

I thought it was all about having a great education system, but as I learned, I realized that it wasn't really that guaranteed.

So we've chosen two things, and that's where everything our foundation does is focused on.

We asked each of them to choose a picture that tells the story of their work, and this is Melinda's choice.

what kind of picture is it?

One of my favorite things to do when I travel is to go out into rural areas and talk to women, whether it's Bangladesh, India, African countries, I go as an anonymous Western woman.

I will not identify myself. I will go in casual clothes.

I was talking to a woman there, and the more I traveled, the more I heard, "I wish I could use these injections..."

And when I was talking about the vaccines that kids got on the ground, that's what led me to say, "So what about the injections I'm getting?"

They were injecting a contraceptive called Depo-Provera.

When I got home, I spoke to some global health experts, and they said, "No, contraceptives -- they're in stock in the developing world."

I needed to do more research into the report, and the team found that the most sought-after drug by women in Africa was out of stock for more than 200 days a year.

Africa has plenty of condoms, the United States and other countries committed to fighting AIDS.

Thanks for your support

But women keep saying, "I can't talk about condoms with my husband.

It's like saying he or I have AIDS, so what we need is a birth control pill that will give us more time between births so we can feed our children and give them an education."

Melinda, you're a Catholic, and you've been embroiled in controversies about this issue, and the pros and cons of abortion, both for and against.

How are you coping?

Well, I think that's an important point, that as a global community, we've stayed away from the discussion of contraception.

We knew that 210 million women around the world wanted contraceptives, but we didn't even provide them in the United States because of the political debate in our country, which in my opinion was a criminal act.

I'm a Catholic, but I'm a proponent of contraception. Most Catholic women in the United States say they've used contraceptives, and I don't think this debate should be a barrier.

We used to have a poll on birth control in the United States, but we were able to do it globally and raise $2.6 billion to help women contracept.

(Applause) Bill, this is your graph. What is it about?

My graph has numbers

(Laughter) That's a nice graph.

This is the number of children who die before their fifth birthday each year.

What I want to tell you is that we're doing great things with this little-known, amazing success story.

Twenty million was the number when I was born, and now we've reduced that number to six million.

This is largely due to vaccines

Smallpox used to kill millions of children a year.

Smallpox has been eradicated to zero.

Measles kills millions a year

This number has also been reduced to hundreds of thousands.

So what this graph shows is that there is hope that the number of deaths will continue to decline, and that we can do this by using research into new vaccines to reach our children.

It is also possible to accelerate this movement

The number of children dying in the last decade is falling faster than ever before, so what I love about it is that when a new vaccine is developed, you can get it, use this kind of update, and deliver it properly -- and miracles can happen.

So if you do the math, that means thousands of children's lives are being saved every day compared to the previous year.

this has not been reported

Things like plane crashes that killed over 200 people get a lot more headlines.

Doesn't it bother you?

Well, things are going on silently.

Children are dying one by one

98% of deaths have nothing to do with natural disasters, and people's outreach to natural disasters is amazing.

It's amazing to make people think, "Tomorrow is my life," and to collect money.

Children's problems, on the other hand, are less visible.

Now, with the Millennium Development Goals and other initiatives underway, there's a growing circle of support, and the goal is to get well below a million people, which should happen in our generation.

Maybe what was needed was the involvement of someone who was good at numbers and graphs, not a grieving person.

In this year's annual letter, as I said earlier, you went on to say that, contrary to popular belief, aid to developing countries is not in vain or broken, but effective.

Yes, for example -- well-intentioned but unsuccessful aid.

Even if you're serious about venture investment, there are times when things don't go well.

We shouldn't say the attempt was bad just because it wasn't perfect.

What was the goal?

How are we going to improve nutrition, survival rates, literacy rates to help the country help itself?

we can use aid wisely

Not everything is a panacea

I think it will do better than the investment business, and this is a very successful example.

It has long been said that it is difficult for a married couple to work together.

What's your secret?

A lot of women have told me, 'I can't work with my husband.

It will never go well.”

But we're having fun. In life's journey of learning, Foundation work came to us both. Actually, we don't travel together as much for Foundation work as when Bill was at Microsoft.

We go on separate business trips a lot, but what I do know is that when I return, Bill will be interested in what I've learned about the state of women and girls, new news about vaccine procurement, and great leaders.

listen carefully and show interest

It's the same for Bill, and when I get home, I'm genuinely interested in his talks, his data, and what he's learned, and I think we're collaborating.

Of course not all the time

(Laughter) But now we're working together.

Melinda, when the foundation was first established, you were the main manager.

About six years ago, Bill retired from the front line at Microsoft and became a full-time employee.

Wasn't it difficult until you got used to it?

Well, I think the Foundation staff had more concerns about welcoming Bill than I did.

i was thrilled

Bill made this decision, of course, before he made it public in 2006, and it was his own decision, but it all started on that beach vacation when Bill conceived the idea while we were walking along the beach.

For me, it was nice to see Bill pouring his mind and heart into the global issues and injustices that confronted us.

Foundation personnel, on the other hand, had vague apprehensions.

(Applause) Great.

But three months after Bill came, it disappeared.

Some employees have disappeared.

That's right, it's about the staff. You disappeared three months after you took office, right?

Bill: Just kidding. Melinda: The staff hasn't disappeared.

A few people have disappeared (Laughter) What are you two arguing about?

Sunday morning at 11:00, no work, what's the topic? What will be the discussion?

We built the foundation from the ground up, just the two of us, and we have a great working relationship.

When I started Microsoft, my partner was Paul Allen.

When the company was growing up, it was Steve Ballmer, and now it's Melinda. Stronger, more equal partners than ever. is

Melinda has a lot of insight

Talk face-to-face with staff

As she said, business trips are separate.

There are many things that we do together in that way.

I can't think of a situation where one of the two people would never give up their opinion.

But what about Melinda? Can't you guess? (Laughter) It's possible.

my thoughts are like this

We have different angles of approach, and I think that's good.

Bill looks at big data and says, "I want to act on global statistics."

i follow my intuition

I meet with a lot of people in the field, and what Bill taught me was to take these conversations and cross-check them with global data.

Decisions like, "Are mothers willing to give polio medicine?"

Because the distribution part is just as important as the science.

So this activity has brought us closer to each other's way of thinking, and frankly, I think that's why we're doing a better job.

Now, you've both had great success in things like vaccines and polio.

What about failure cases?

Can you tell us about your failures and what you learned from them?

Well, fortunately, there are some stories. Of course, there were mistakes.

If you do a lot of work with drugs and vaccines, you're bound to make a lot of mistakes.

For example, one of the most popular examples is the public offering for next-generation condoms.

there were hundreds of submissions

some may succeed

We were naive, no doubt I was naive, about India's medicine for visceral leishmaniasis.

But in reality, I had to take injections every day for 10 days.

It turned out that drug development took three years longer than expected, and there was no way to get it to the field.

Luckily, we found out that killing sand flies can prevent disease, but it took us five years, and five years and sixty million dollars to make very little progress, and you'd be forgiven for saying it was a waste of money.

They both get about a billion dollars a year in subsidies, I think for education.

The story leading up to it is quite long and complicated.

Do you have any failures that you would like to share?

A big lesson from our early work was that we thought that small schools would solve the problem.

Contributing to lower dropout rates

Smaller schools have less violence and less crime.

But what we've learned in this project, and what we've found to be the key, is having great teachers in the classroom.

If you don't have strong teachers on the ground -- it doesn't matter how big or small your building is -- you can't change the course of a student whether they go to college or not.

(Applause) Melinda, this is you and your oldest daughter, Jen.

Only three or four weeks ago, where is this?

Tanzania Jen has been

going

My children have been to Africa many times.

We changed our plans and spent three days and two nights with a local family.

Your parents' names are Ana and Sanare

They let me sleep in the boma (hut)

There must have been goats in that fenced-in hut before we visited.

I was able to stay with that family, and it was there that I learned first-hand what life was like in rural Tanzania.

It was completely different from visiting for a while, spending half a day and coming back, and staying overnight.

They have six children, and I spent five hours that day cooking with Anna in the kitchen hut. As we talked, I learned that Anna had been planning to space her births in consultation with her husband.

It was a very loving couple.

Her husband was a Maasai warrior, but they decided to get married, a relationship where respect and love were evident.

The middle of the six children is a 13-year-old boy-girl twin, and the girl's name is Grace.

We chopped wood and did everything Grace and her mother would do. Grace is an adolescent, not a child anymore, but not an adult either.

she was very shy

She wants to talk to me and Jen.

We called out too, but we were shy.

But at night, just like in the middle of nowhere in Tanzania, all the lights went out.It was the first night, and there was no moon, no stars.As Jen stepped out of the hut with her outdoor headlamp, Grace followed immediately.With an interpreter, she rushed over to Jen and said, "Can you give me a headlamp when I go home, so I can study at night?"

That's amazing

I asked my father, but unlike the twin boys who passed the middle school exams, Grace, who helps with household chores, didn't pass the exams and still can't get into public school.

The father said, "I don't know if I can pay for her education.

Private schools are too expensive, and like my wife, my daughter may end her life on this farm."

So they know that education makes a big difference.

Here's another photo of their two children, Laurie and Phoebe, with Paul Farmer.

Raising three children in one of the richest families in the world is like doing a social experiment that's very unprecedented.

What is the secret of your success?

How were you raised?

Well, our children have had an excellent education, but we have also made them very aware of their abilities, their careers, and what they want to do in the future. The policy that we have been very clear about is donating most of our assets to foundations and helping children find their passions.

We want our children to have a balance, because they can do whatever they want, but it's not going to be a lot of money and they can just play and do nothing.

So far, the kids have been pretty hardworking and excited about their career choices.

Of course, you've been careful to protect your child's privacy.

Why did you give me permission to show you a picture of your child this time?

Interestingly

As our children grow up, we know that our family mantra is "responsibility." Even to live in the United States and have a great education is an incredible privilege, and we have a responsibility to give back to the world.

As they've grown up, we've taught them, we've traveled all over the world, and they say, "We want you to know that we believe in what Mom and Dad do, so you can tell us more about us."

So it's a good thing that I put this picture out there, and I think Paul Farmer will probably put it in his book.

Children really care about the Foundation's mission.

You have enough money to make your three children millionaires, even if you donate a lot of money to your foundation.

Do you have such plans?

no i'm not going to leave it like that

Children need to feel that their work is rewarding and important.

Before we got married, we read Warren Buffett's words in an article that convinced me that leaving a large fortune to children is not good for society or good for children.

Warren Buffett had an amazing time in 2006 when he, his only rival to be America's richest man, suddenly changed course and decided to donate 80 percent of his fortune to your foundation.

What happened?

there will be a long version and a short version

I'd like the shorter one today

Okay, Warren was a close friend, and he intended to leave all his fortune to his wife Susie.

Unfortunately, Susie passed away before that, and she loves to delegate -- (Laughter) Warren... Tweeting just now.

We couldn't hide our surprise that if there were people who were good at something and they could do it without asking for money, that would be fine.

Melinda: I was really surprised. Bill: I didn't expect it.

Your donation has dramatically expanded the foundation's capabilities.

Half of the foundation's wealth comes from Warren's amazingly generous donation.

The two have pledged to donate more than 95% of their assets to the foundation by the time they complete their duties.

that's right

(Applause.) Lately, you and Warren have been busy trying to convince other billionaires and successful people to donate more than half of their fortunes to charity.

How are things going?

So far, about 120 people have agreed to the “Pledge to Donate”

What's so appealing about this movement is that allies come together every year to talk about how they've created more jobs and what kind of charity they've done.

We do not aim for homogenization

The beauty of philanthropy is its incredible diversity.

someone does alms

we see it and we scream

that's good

That's the role of philanthropy, and it's about taking different measures within a single subject, like education.

need to experiment more

But I'm having a lot of fun. I meet members and hear about their journey to philanthropy and parenting.

Going forward, the organization will continue to grow in terms of size.

It's also important to show people that people are making a difference through their philanthropic efforts, because they're the people who started their own businesses and used their creativity to bring great ideas to life.

Using their ideas and talents to create philanthropic causes, we can change the world.

They see what other people are doing, and they say, "I want to do the same thing with my own money."

i think it's great

I think it's hard for some people to comprehend the idea of ​​spending that kind of money indirectly on something else.

There must be millionaires and successful people in this hall.

Would you like to sell it here?

How would you invite me?

This is what gives us the greatest sense of fulfillment. When you die, you can't take your money with you. If leaving wealth to your children isn't the best option, let's brainstorm ideas about what we can do.

The world is a much better place because of the philanthropists of the past.

The reason I'm so optimistic is that I believe that community service will continue to grow and shed light on the political gaps and steer them in the right direction.

The world is riddled with unacceptable inequality, and the problem of structural inequality is increasing.

It seems to me that if more allies followed the path that you two have forged, it would have an effect both on the issue itself and on the perception of the issue.

What do you think?

I agree. It would be nice if we could give the wealth of those who have to those who don't.

balanced and fair

But we have to change the system.

In the United States, we're trying to change the education system to be fair for everyone and serve all students.

I believe this is the real change to reduce inequality.

that's the most important thing

(Applause) I am sure that you in attendance and millions of people around the world will be in awe of your journey and the remarkable contributions you have made to shaping the future.

Both of you at TED — thank you for all your talk and work

Bill: Thank you Melinda: Thank you

(Applause) Bill: Thank you. Melinda: Thank you very much.

Bill: Good luck. (Applause)

At this very moment, an enthusiastic female teacher is poring over a 60-page dissertation. As she reads a paper based on ancient educational theories developed by past educators who no longer exist, she imagines in her mind how this effort will come to fruition.

At this very moment, an aspiring teacher, majoring in education in graduate school, watches a professor ramble on about "how to attract students," in a wonderfully unengaging narrative.

At this moment, a new first-year teacher is at home scouring out lesson plans, thinking about how to properly grade her students and stay within the rules. At the same time, she tells herself over and over again, "Don't smile for three months," because that's what she learned in her teacher training program.

At this very moment, a student has a brilliant idea and goes to his parents to convince them that they are so sick that they cannot go to school tomorrow.

On the other hand, at this very moment, a wonderful teacher is sharing his wisdom and knowledge with a wonderful narrative, and his students are leaning out of their chairs, waiting patiently for the glittering drops to fall on their foreheads, listening intently to soak up as much knowledge as possible.

At this very moment, a person is compelling the hearts and minds of an entire audience, unfolding a most compelling story of what is happening in the world that has never been seen or imagined.

Right now, there's someone who can manipulate an audience by telling them, "Put your hands up," until he says, "Now you can put them down."

this moment

Someone might say, "Hey, Chris, you just talked about someone who's been badly trained, and you're also talking about a very powerful and good educator.

If you're thinking about education in the world, especially in the city, I'm sure the two will cancel each other out, and in the end there's no problem because there's zero plasticity.”

In fact, the story I'm telling you now is the current state of teachers, where the best storytellers, the master storytellers, are far removed from the classroom.

People who know how to teach and how to attract people don't even know what a teaching license means.

Maybe they've never had a course of what you could call an education.

it's a pity for me

Sadly, these people are disinterested in the learning process, and they want to be very effective teachers, but they have no role model.

There are words by Mark Twain

He said, "Proper preparation and education is such a powerful force that it can transform moral evil into good, bad customs into powerful establishments, and that power can sometimes transform humans into angels."

The people I mentioned earlier are not just in a university or some other educational institution, they're just in a place, and they've learned their strengths and they know how to "teach" them properly.

where is that place?

In barbershops, in rap concerts, and especially in black churches.

I call it Pentecostal Teaching

Have any of you ever been to a black church?

How many people are there?

When you go to a black church, the pastor first tries to get the audience's attention. He starts preaching in a joking tone.

And he said, "Amen?"

Audience: Amen

Chris: Can I have an amen? AUDIENCE: Amen!

This is how people suddenly wake up

The pastor bangs on the pulpit to get attention.

And when you pull your audience into a more tense atmosphere, keep that voice low and low. And that's the ability we need most from our teachers today.

Why is it that teacher training programs only teach theory and theory and standards, but not how to do the basic magic of engaging students and audiences?

I'm speaking out to reframe this way of teacher training. It can be content-focused, it can be theory-focused, but without magic, teaching and learning are meaningless.

When I say this, people often say, "Magic is just magic."

Teachers who have worked hard to develop those skills can get jobs in schools, and when they succeed in attracting the attention of their students, the principal will come along and say, "Hey, he's great. I wish all the teachers were like him."

and then just say, "He has magical powers."

But I'm here to tell you that power can be taught.

magic can be taught

Magic can be taught!

Now how?

To teach is to take people to places where magic is born.

If you want to be a good teacher in an urban education, get out of the university grounds and into your neighborhood.

You go to the barbershop and spend time, or you attend mass at a black church, and you stare at the power of attraction that's going on there, and you take notes on how they're behaving.

The education department at my university started a project where every student went to a rap concert.

Observe how the rapper moves and speaks with gestures.

Then students learn how rappers walk proudly on stage.

As you listen to the metaphors and analogies they throw at you, you learn bit by bit, and with enough practice, that's the key to making the magic happen.

By just staring at them and moving their eyebrows a few millimeters, they'll learn that it means "I want more," even without words.

And if we can apply this to teacher training, if we can teach magic to teachers, we can resurrect classrooms that have fallen silent, reignite imagination, and revolutionize education.

Thank you

(applause)

When you think of a city, there's something that immediately comes to mind.

The buildings, the roads, the skyscrapers, the noise of taxis.

But when I think of cities, I think of people.

Cities are essentially made up of people, and the places they go, the places they meet, are at the core of how a city functions as a city.

So what's more important than the buildings in the city is the public space that exists between them.

The most dramatic changes in cities today are happening in these public spaces.

So I believe that the presence of lively, joyful public spaces is essential to the planning of a great city.

Public spaces breathe life into the city

So what should public space look like?

What attracts people to public spaces and what keeps them away? What is it that drives people away?

I thought that if I could answer that question, I could make a big contribution to my city.

Actually, I'm an ethologist, and I don't use my skills to study animal behavior, but to study how people in cities use public spaces.

One of the first spaces I studied was a tiny park in midtown Manhattan called Parley Park.

This little space created a bit of a buzz, and it had a huge impact on New Yorkers, and it made a big impression on me.

I observed this park early in my career, because it was my father-in-law's park, so I knew places like Purley Park didn't happen by accident.

As soon as I took a look, I realized that this place was made with tremendous dedication and meticulous attention to detail.

But what was the secret that made this space so special and what made it so popular?

I sat in a park and took a careful look, and the first thing that caught my eye was a comfortable, movable chair.

People would come in and find a place to sit, they would move it around, and they would sit there for a while, and the funny thing was that people attracted more people.

Then there was greenery in the park

This little park provided what New Yorkers crave: peace and greenery.

But my question is, why aren't there more trees in the city and more places to sit -- where people don't feel alone and feel like uninvited intruders? was that

Unfortunately, cities aren't usually designed that way.

this is a common scene

Squares have been designed this way for decades

Stylish, understated design is common in modern architecture, but it's natural for people to avoid these spaces.

Not only does it feel dreary, but it also feels dangerous.

where should i sit

what should i do here?

But architects love this style

This style is fundamental to the creation of architects

The style could be a sculpture or two, but that's about it.

This architectural style is ideal for developers

Nothing to water or maintain No need to worry about suspicious figures

But don't you think it's a waste?

For me, being a city planner meant being able to truly transform the city I lived and loved.

What I wanted to create was a place that made me feel like I felt at Parley Park.

But over the years, I've learned how difficult it is to create meaningful, comfortable, successful public spaces.

As I learned from my father-in-law, it doesn't happen by accident, especially in a city like New York, where you have to fight to create public space in the first place, and for it to succeed, someone has to think through every detail.

Now, we can say that the urban vacant lot is an opportunity.

It's an opportunity for commercial investment, but it's also an opportunity to realize the public interest of the city.

The first time I was able to fight for the creation of great public spaces was in the early 1980s, when I was leading a team of planners at Battery Park City, a huge landfill on the Hudson River in Lower Manhattan.

This dusty wasteland lay barren for ten years, and we were told that if we didn't find a developer in six months, it was going bankrupt.

So we came up with a radical -- out of the ordinary idea.

Instead of building parks as a complement to future development, let's reverse the formula and start by building small but very high quality public spaces and see what effect that has.

We only had two lots, which later turned into a mile-long boardwalk, and it had to be perfect.

I stuck to building a mock-up I stuck to building a mock-up Made a full-scale railing and breakwater out of wood

And when I tried to sit on the bench, still in the dust, the railing came right up to my eye level and blocked my view, ruining my waterfront experience.

This is how detail really matters.

Design is not just how something looks, but how your body feels when you sit in that chair in that space. I believe that good design is always based on personal experience.

Everything looks complete in this picture: the granite rim, the lights, the bench backs, the trees planted, the different sitting areas, and it all came from a little battle, and it turned out to be a project that made people want to be there.

This turned out to be invaluable 20 years later, when Mayor Michael Bloomberg entrusted me with the design of all of New York City as his City Planning Commissioner.

He told me that day that New York's population was expected to grow from 8 million today to 9 million in the future.

So he asked me, "Where would you put another million New Yorkers?"

i didn't know what to say

As you all know, New York encourages immigration, so the prospect of population growth is good news for us.

Where are so many New Yorkers going to live?

If it can't spread any further, maybe that's a good thing, but where should we build new housing?

And what about cars?

Our city can't have more cars

So what should we do?

If you can't spread out, then stretch upwards.

And I have to grow to a place where I don't have to own a car

So that means taking advantage of our incredible wealth of transportation.

But we never really thought about how we could make the most of this.

the answer was

We thought that if we could cluster new developments around transportation, we could absorb this population growth.

And this is the plan, and what we're going to do is: rethink zoning -- zoning is a legal tool for urban planning -- citywide -- to determine where new development can occur, while banning development in suburban-style neighborhoods built on automobiles.

Yeah, this was an incredibly ambitious idea, ambitious because it required the community to agree to these plans.

So how did I manage to do this?

It starts with listening. I started listening. I've done thousands of hours of listening just to actually build trust.

Community is what you know if you understand the area.

you can't fool their eyes

So I walked over and started listening

How many districts have I been to? Sweltering summers, freezing winters, year after year, year after year, just to understand the DNA of each district and to get a sense of what each alley feels like.

I had become a surprisingly geeky expert on use regulation, solving community concerns with use regulation.

Little by little, from district to district and from parcel to parcel, we re-established building height limits to make new developments more predictable and more likely to occur near transportation networks.

It took 12 years to reorganize zoning, 124 neighborhoods, 40 percent of the city, 12,500 blocks were rezoned, and 90 percent of New York's development areas are within a 10-minute walk of the subway.

In other words, people living in these new buildings don't have to own cars.

The restructuring of end-use regulations was hard and strenuous, but it wasn't my mission.

Can't see or feel usage regulation

My mission has always been to create great public spaces.

So in the districts that I've designated as encouraging major development, I was determined to create spaces that would make people's lives better.

Three kilometers of abandoned and dilapidated waterfronts like this one were in the Greenpoint and Williamsburg neighborhoods of Brooklyn, and we couldn't get there or use them.

Because of the sheer size of this area, I felt a responsibility to build a magnificent park on this waterfront, and I put an enormous amount of time into each and every corner of these plans.

I wanted it to have a tree-lined path running from the plateau to the water's edge, full of trees and shrubbery, and of course, plenty of places to sit.

I honestly had no idea what it would look like

after that i just believed

But I put everything I'd ever studied and learned into this project.

And it's done, and it's been a great success.

People from all over the city visited these parks.

The park changed the lives of the people who lived there, but it also changed the way New Yorkers perceived the city.

I go there a lot and watch people board this little ferry, and now it connects several sections, and for some reason I don't know, it's just like it's always been there.

This is a new park in Lower Manhattan

Lower Manhattan waterfront was a total mess before 9/11 Lower Manhattan waterfront was a total mess before 9/11

Wall Street was a landlocked land, because you couldn't even get near the water.

After 9/11, the city lost most of its control.

But I went to the Lower Manhattan Development Company and thought that if I could get the money to restore this three-kilometre strip of dilapidated waterfront, it would have a big impact on the rebuilding of Lower Manhattan.

so i ran

Lower Manhattan finally has a public waterfront on all three sides.

i really like this park

The railings are high, and the bar stools can be placed by the sea.

The railing is wide enough to place your lunch or laptop.

I love it when people go there and look at the scenery and say, "Wow, Brooklyn looks so close!"

So what's the secret?

How can we turn a park into a place for people to relax?

It's up to you, not as a city planner, but as a human being.

not design expertise

take advantage of humanity

would you like to go there?

Would you like to stay there?

Do you have a good outlook there?

Anyone else?

Does it look green and friendly?

Will there be a place to sit for you?

Now there are places all over New York City where you can sit.

In what used to be a parking lot, there's a pop-up cafe.

Where there used to be Broadway traffic, there are tables and chairs.

Twelve years ago, sidewalk cafes were banned, but now they're everywhere.

But it wasn't easy to put these spaces into public use, and it's even harder to keep them that way.

So let me tell you this story about a special park called the High Line.

The High Line was an elevated railway.

(Applause) The High Line was an elevated railroad that ran through three neighborhoods on the West Side of Manhattan.

When I first saw it When I climbed that old viaduct With all my heart I fell in love with this place Like falling in love with someone else I fell in love with this place Like falling in love with someone else

And when I took this position, protecting the first two sections of the High Line from demolition became my number one and most important project.

If I had forgotten about the High Line for even a day, it would have been demolished.

The High Line, now widely known and enjoying record popularity, was one of the city's most controversial public spaces.

What looks like a beautiful park to you doesn't mean everyone sees it that way.

It's true that commercial interests always stand in the way of public space.

You might think, "Four million people from all over the world come to visit the High Line. It's pretty amazing."

Developers only look at one thing: attracting customers.

"Why don't we remove this plant and build a shop next to the high line?"

"Isn't it wonderful that the city will be richer than that?"

no i don't think it's great

It's a mall, not a park

(Applause) And that could mean more funding for the city, but the city should have a longer-term view, a view of the public good.

More recently, the last section, the third section of the High Line, the last section of the High Line, was competing for the interests of the developers, the city's primary developer, who was building over 1.6 square kilometers of construction at Hudson Yards.

They came to me and suggested that the third and final section of the High Line be "temporarily dismantled."

Maybe the High Line just didn't fit their image of a city of glittering hills and skyscrapers.

Maybe it was just a nuisance

Anyway, after nine months of constant, day-to-day negotiations, I was able to get a signed agreement banning the demolition, and that was only two years ago.

No matter how popular or successful public spaces are, they shouldn't be taken for granted.

Public space always -- public space needs a vigilant guardian, not only to win it for public use, but to design it for the people who use it, to maintain it so that it remains good for everyone, to protect it from being invaded, ransacked, abandoned and devastated, or left unnoticed.

One thing I've learned through my life as an urban planner is that public space has power, and that

It's not just the people who gather there, but it's born out of the fact that many people cherish the city by thinking of it as a public space.

Public spaces can change the way you live and feel about your city.No matter which city you choose, public space is one of the big reasons why you live in it.

I believe that a good city is like a very nice party.

People gather there because it's fun

thank you

(Thank you for applause

What do science and technology have in common?

Curiosity and surprise, because that's what drives us to explore, because we're surrounded by the invisible.

I like to use film as a vehicle to travel through the doors of time and space, to make the invisible visible, because it expands our horizons, changes our perceptions, opens our minds, touches our hearts.

Here's a snippet from my IMAX 3D movie, Mysteries of the Unseen World.

(Music) Some things move too slowly for our eyes, and time-lapse photography allows us to discover and expand our perspective on life.

It shows how life is born and how it grows, and how the vines crawl up from the forest floor in search of sunlight to survive.

On a large scale, time-lapse photography allows us to see the motion of the Earth.

You can see not only the vast expanse of nature, but also the restless human activity.

Each stream of light points represents an airliner. By turning air traffic data into time-lapse footage, we can see something that's always overhead but invisible: the vast airline network over America.

You can do the same thing with seas and ships.

We can turn data into a time-lapse video of how the global economy works.

Decades of data give us a picture of the entire planet as a single organism, supported by ocean currents and atmospheric clouds, beaten by thunder and crowned by aurora borealis.

It's the ultimate time-lapse film, an anatomical map of the living earth.

At the other extreme, there are things that are too fast for our eyes to see, and there are technologies that make them visible.

High-speed cameras allow us to do the reverse of time-lapse photography.

By shooting a thousand times faster than our eyes can see,

You can see how nature's ingenious devices work, and you might even be able to imitate them.

When you see a flapping dragonfly fly by, you may not realize it, but it's nature's greatest flier.

It can hover in the air, go backwards, and even fly upside down.

By attaching tracking markers to the insect's wings, we can visualize the airflow that the wings create.

What no one knew was that high-speed photography showed that a dragonfly could move its four wings independently.

From this knowledge, we may be able to create entirely new flying robots that allow our eyes to reach faraway places of importance.

We big are too small to see what we can't see

Electron microscopes can produce images of objects magnified millions of times by illuminating them with electrons.

this is a butterfly egg

There are invisible creatures all over our bodies, these mites-like creatures that spend their entire lives on our eyelashes and crawl out onto our skin at night.

do you know what this is?

it's shark skin

caterpillar mouth

Drosophila eye

Egg shell

fleas

snail tongue

We think we know the living world, but there may be millions of species of tiny creatures that have yet to be discovered.

Spiders also have a big secret: spider silk is stronger and more elastic than steel of the same weight.

This journey continues into the nano world.

Spider silk is only 1/100th the thickness of a human hair.

On top of that is bacteria, and next to it is a virus that's 10 times smaller than the bacteria.

Inside the virus, there are three strands of DNA that are 10 times smaller.

Individual carbon atoms are at the limit of what you can see with the most powerful electron microscopes.

Using a powerful electron microscope tip, it is possible to move atoms and create amazing nanodevices.

One day, such a device will patrol the body for disease, while also cleaning out clogged blood vessels.

Little chemical machines of the future may one day repair DNA.

We are one step ahead of a tremendous breakthrough born out of a desire to unravel the mysteries of life.

Amid an endless rain of cosmic dust, the atmosphere is filled with pollen, tiny diamonds and gems from other planets and supernova explosions.

People live surrounded by invisible things

Knowing that there are so many invisible things around us will change the way we see the world. Seeing the invisible world makes us realize that we live in a living universe, and this new perspective intrigues us, and we might even consider becoming an explorer in our own backyard.

What's waiting to be discovered What new surprises will change our lives Who knows?

There is no choice but to see

(Applause) Thank you very much. (Applause)

English like me won't understand anything

It's good because you can take a break after all these wonderful people.

It's kind of out of place for me to be here 'cause my job doesn't do me any good in life.

I feel like I'm useless

And after Carolyn and the other speakers, I'm like shit.

I don't know why I'm here at all.It's like in a nightmare, as soon as I came to the opera as a double, I was forced to say, "You sing!"

I don't know, but that's why I have nothing to show you and nothing to say, so let's talk about something else.

If you don't mind, as a start...it's nothing interesting...but let me tell you how I do my job.

If someone asks you what you're known for, it's a lemon squeezer, a toilet brush, a toothpick, a beautiful toilet seat, and a toothbrush.

I don't try to design a toothbrush

I have no intention of saying, "Oh, I'm sure it will become something beautiful."

I'm not interested in that kind of thing

There are many different types of designs

One is what we call "twisted design" -- it was put forward by Raymond Loewy in the '50s.

Design should be a marketing arsenal, to make a product sexier and to increase sales.

That's why I call it "twisted design."

Then came narcissistic design, design by great designers for other great designers. And then there were people like me, trying to find their worth -- to be ashamed of their useless work, but to find other ways of doing things -- not to make things for things, but for results, for the benefit of mankind, and for those who use them.

When you get your toothbrush, you don't think about your toothbrush

I think, "How well can I polish it?"

To understand how a toothbrush works in your mouth, you can't help but think, "Whose mouth is this?

what would that person's life be like? What kind of society do you live in?

What civilization created that society?

What animal species created that civilization? ”

If you go that far...it's not smart, so it takes about a minute...but if you go to the animal species level, it becomes interesting.

I don't have the power to change anything

If I go back I can see why it's better not to change It's better not to change today than to change

When I think about my positioning as an animal species—

I realize what to look for, and there are also big challenges.

the challenge before us

Because there's no human creation that exists outside of what I call the "big picture."

The "big picture" is our story, our poetry, our romance.

Our poetry is our mutation and life

Remember, as my 10-year-old son says in his book, life began about four billion years ago. 42?

(Audience seats) 45!

It's 45. Please bear with me. I'm just a designer.

Originally, there was something called "Primitive Soup," and this first soup was just kind of a mess, kind of filthy mud, with no life.

Then I'm scared! …Lightning strikes…Bika! … Here we come … Bika! …I got my life…Bokoboko! …I died

Millions of years later... Bikabika! Bumpy! …Hey wake up!

It finally worked out and life was born

We were the stupidest, stupidest microbes.

We even imitate reproductive methods, right? You know what I mean? Or... oops, it's nothing

Then we became fish, then we became frogs, then we became monkeys, and today we are the supermonkeys. Interestingly, we supermonkeys are still in the middle of the story.

Can you imagine We who were such stupid microbes are mobile phones and iPods in 4 billion years

As Carolyn and you all know, the sun will eventually explode, and the earth will either burn up or explode.

That's about it. In other words, we're still in the middle of the story.

This is amazing! Isn't it beautiful!

Can you imagine so iconic

After all, microorganisms 4 billion years ago had no way of knowing what we are today.

And we today have no way of knowing who we are four billion years from now.

This area is wonderful

This is our poem, it's a beautiful story

It's our romance Sudden mutation We are mutants

Unless you hold onto this and integrate it into the story, it's going to be utterly irrelevant.

'Cause everybody thinks they're the last generation

We have one view of the earth, you see, you know, "I am the human race, the perfection of the human race."

Repeated mutations for 4 billion years Now that I have emerged, evolution has ended The end of the show, the end of eternity, is this me in the red jacket

It's like, well, I'm still saying this

There's a lot to do, it's so fresh

Here's one thing: it's no one's duty to be a genius, but it's everyone's duty to participate.

Mutant folks, there's a minimum of training when you come in.

can be called sports

First of all, there's a very simple one, visual training.

I'll explain. I'll try.

If you walk like this, it's okay. You can walk.

I'm falling I'm dying It's very dangerous

So maybe I'll try a field of view angle like this.

Okay I can see it If you find something oops oops just like that

I looked up, but I'm still very...selfish, selfish...selfish

But I'll survive

And if you raise your eyes just a little bit, "Hey, have you been here? How are you? Let me help you design a new toothbrush How about a new toilet brush?"

You could say that we live in society, we live in community.

OK, I've stepped into the realm of intelligence.

The higher you look from this point, the more important you are to society.

The higher you raise it, the more important it becomes for civilization.

The higher you raise it, the farther and higher you can see, the more important you become to the mutation story.

So intelligent people are here, this is the intellectual realm.

The angle from here to here is genius

Ptolemy Eratosthenes Einstein

No one is obligated to be a genius

nice but not obligatory

Train hard and become a good mutation

There are dangers and traps. One is vertical.

When you stand upright and look up like this, "Oh God! There is a God! Oh God!"

God is a trap Bring God up when we don't know the answer

So when your brain isn't big enough and you can't really understand it, you say, "Oh God! God can do it!"

That's why I'll jump like this No, don't jump

Come back 'cause there's another trap

If you lean back like this, you'll see the past again.

Then you get schizophrenia and die again.

That's why I look up every morning because it's a good mutant.

Outward, more horizontally, as an intelligent life form

Never forget this feeling, this feeling

This is very, very, very important

What else happened? Why do you do this exercise?

Seen from afar, our evolutionary path is a straight line—

The line is clearly moving forward

From a distance, yes, it's very smooth.

But when I look through the lens, it's like a bumpy bump

and made of light and shadow

Light represents civilization, shadow represents savagery.

It's very important to know where we are

because it changes my role.

Think about it, I wouldn't say it was great, but there weren't many wars in the '80s.

In that situation, people like me are accepted.

You could call it the “era of luxury.”

I have time to think...what else - I have time to talk about art and things like that.

It's okay 'cause we're in the bright spot

But sometimes, like today, it can quickly descend into darkness and become savage.

There are actually various kinds of savagery

There will also be savagery unfamiliar to us

There are many kinds of barbarism

so you have to adapt

When barbaric times come, forget beautiful chairs and hotels, forget design...and, excuse me, art.

Because there are more important and urgent things to do

I have to go back to politics, to radicalization.

Back to the fight, we have to face it

That's why I'm ashamed of this job today

That's why I'll do my best here

But even if I do my best (that's why I'm the best!) it's nothing

'Cause it's a different time

Even good things don't shine unless they're at the point of light There's no point in beautiful dreams or civilizations

And we have to do our best to complete the story.

This civilization scenario is about love, progress, and so on.

The scenario for our civilization is to gain power and become more intelligent, like our concept of God.

We are the gods now The end of the story is near

All that's left to do is finish

very very important

You can't go there and fight or work or create if you don't know what's really going on.

If you go backwards into the future like this, oops, it's dangerous

I'm going to fall. It's very dangerous.

That's why you absolutely have to understand

Again, the end of the story is near.

The great thing is that in the next 50 or 60 years, we can complete this civilization and give our children the possibility to create new stories, new poems, new romances.

Billions of people were born, worked, lived and died before us, and thanks to their efforts, we now have beautiful things, gifts and knowledge.

I can tell my children, our story is finished

Now it's your turn to spin a new story, a poem

There is only one rule, the next story is still blank

Give me a blank sheet of paper, please create

I'll give you the best, best tools, so please get started

So I keep working, even if it's for a toilet scrubber

I was born and raised in Sierra Leone, a very beautiful little country in West Africa, a country rich in creative talent and natural resources.

But Sierra Leone is also known for its decade-long civil war in the 1990s, where village after village was burned.

It is estimated that about 8,000 adults and children have had their hands and feet amputated.

I was about 12 years old when my family and I were evacuated, and I made a vow to myself that no matter what, I would never allow my children to go through the same experience.

Now my children live in a country where war and amputation are no longer tools for power struggles.

Seeing people I know and love recovering from this ordeal, one thing that really bothered me was that many of the amputees in Sierra Leone don't use prosthetics.

The reason was that prosthetic sockets didn't fit well and hurt.

The prosthetic socket is where the amputee puts the rest of the limb, and it runs all the way to the ankle of the prosthesis.

Even in the developed world, it can take anywhere from three weeks to several years for a patient to get used to the socket, if at all.

Molded in the traditional way, made from a single material by a prosthetist.

The socket puts a lot of pressure on the user's residual limb, causing pain and blistering.

It's the same no matter how strong your ankle is

If the prosthetic leg socket doesn't fit, I can't use my leg.

Two and a half years ago, I met Professor Hugh Herr, and when he asked me how I could solve this problem, I said, "I don't know yet, but I'd love to find out."

So during my PhD at the MIT Media Lab, I designed a prosthetic socket that's cheaper, quicker to build, and more comfortable to use than ever before.

We used MRI to take pictures of the patient's remaining limbs, and we used the finite element method to better predict the stresses and strains that normal force puts on the body, so that we could have a prosthetic socket made.

Using a 3D printer to create a prosthetic socket out of composite materials to relieve pressure on the user's body.

So we're using data to make new sockets faster and cheaper.

In a recent Media Lab trial, one of our patients, a U.S. military veteran who lost his leg about 20 years ago and has had dozens of prostheses, said our printer-made sockets were "soft and like walking on cushions, super sexy."

(Laughter) In this day and age, people with disabilities should be able to lead meaningful lives.

My hope and dream is that the tools and methods that I develop in my research will help bring high-performance prosthetic limbs to people in need.

Healing the minds of people suffering from war and disease begins with creating a useful and inexpensive bridge for the body.

Whether it's in Sierra Leone or Boston, my hope is not only to restore human potential, but to transform the way people think about themselves.

thank you

(applause)

Pat Mitchell: That day - January 8th, 2011 started as usual

The two of you were working hard at your favorite job

You were attending a meeting with the voters you cherished as a legislator, and Mark was filled with anticipation and prepared for the next flight of the space shuttle.

But suddenly, the future they had planned and envisioned all fell apart without a trace.

Mark Kelly: Amazingly Mark Kelly: Amazingly, things can change in an instant

You wouldn't even dream of that

I was the same

Gabby Giffords: Yes

That Saturday morning, I got the dreaded phone call from Gabby's chief of staff.

It seems that there was no information anyway

All I was told was, "Gabby's been shot."

A few minutes later I call, and for a second I thought that call was a dream.

I called the chief of staff back and he said, "Gabby was shot in the head."

From that moment on, I realized that our lives would change forever.

What diagnosis did the hospital give you when you arrived at the hospital? Did they ask how Gabby was doing and how likely she was to recover?

In the case of a traumatic brain injury from a gunshot to the head, doctors often have no idea.

It's unpredictable because it depends on the injury, and the same traumatic brain injury doesn't go like a stroke, which is more predictable.

The hospital didn't know how long Gabby would stay in a coma, when she would come out of her coma, and what her aftereffects would be.

Gabby, was this recovery about becoming the new Gabby Giffords for you? Or was it about bringing back the old Gabby Giffords?

I'm a new me, better and stronger than before

(Applause) Well, if you look at the previous photo, you can see how hard it is to overcome these injuries and recover and come out stronger than before.

No one is stronger than this beloved wife.

(Applause) When was the first sign -- when did you feel that not only were your wounds healed, but that you and Gabby were getting a little bit more back into the life you had envisioned?

The first time I felt this way was when I saw a nearly unconscious Gabby in her ICU bed, doing her usual gestures, and when she was eating at a restaurant, she used to take her ring off and roll it from finger to finger.

It seems that a certain word was also spoken

Were you surprised when you first heard about it?

It was hard at first - What, what? chicken, chicken, chicken

oh yeah it was

For the first month, that was all Gabby could talk about.

Somehow she got aphasia, a disease that makes it difficult to communicate.

For some reason I was able to use the word "chicken." It's not the best, but it's not the worst, either.

(Laughter) Because we actually thought it could be worse than this.

Gabby, what has been the hardest part of your recovery so far?

very difficult to speak very

Gabby, who has aphasia, has something to say, but can't say it well.

I understand it all, but it's just difficult to communicate. As you can see in the picture, the part of the brain responsible for communication is on the left side of the head, and the bullet is passing through it.

That's why you have to take a big risk to speak for your wife.

That's right

It's the most dangerous thing in life

Gabby, are you optimistic about the future recovery? Can you walk more, talk more, move your arms and legs more?

I'm optimistic. It's going to be a long, hard road, but I'm optimistic.

This is Gabby Giffords, right? (Applause) Gabby's always been optimistic.

I really do my best every day

Room Runner Spanish Lesson French Horn on a Room Runner

It's because of my wife -- if you know Gabby before the shooting, you know she's injured, unable to communicate, and under the care of a speech therapist -- and about a month ago, she said, "I want to learn Spanish again."

Let me tell you a little bit more about this wife. This is Gabby before you met her.

He rides a scooter, but I suspect he's much more reserved than the real Gabby Giffords.

Gabby also raced motorcycles.

It's a scooter, but it had - Gabby still has a BMW motorcycle.

are you going to ride? - That's difficult because I can't move my right arm.

I feel like I'm going to see a picture like that next time, Gabby.

Well, when you two met, you were destined to devote your life to the military.

entered the army and became an astronaut

when you two met

What attracted you to Gabby?

The first time I met was in Vancouver, and strangely enough -- I haven't been to Vancouver since -- we met at the Vancouver airport about 10 years ago, and we were both on our way to China.

Gabby is--a "fact-finding"

It's an important fact-finding, if you ask her.

At the time, she was a state senator, and we met here at the airport and left for China.

Did you fall in love instantly?

no no

(laughs) good friends

We've been friends for a long time

(Laughter) About a year later, Gabby asked me out. He asked me out on a date.

Where have you been?

death row cell

Yes, our first date was on death row at the Florence Penitentiary in Arizona, just outside Gabby's legislative district.

In Arizona at the time, there was a debate about crime and punishment and the death penalty.

Gabby was just looking for a companion, and I was like, "Of course I want to go to death row!"

that was the first date

We've been together ever since - that's right

Maybe this is also why Gabby decided to get married.

You wanted to go to death row, too.

I agree

What made you decide to marry Gabby Mark?

good friend best friend best friend

I think we always had a special connection.

We overcame hardships together and our bond only grew stronger - stronger

But it seems that they were able to continue their respective lives after marriage.

did not live together

It was a so-called commuting marriage.

In our case, we went back and forth between Washington D.C., Houston and Tucson.

We were going around those places, sometimes clockwise, sometimes counterclockwise, and that Saturday morning was the first time we lived together.

Less than an hour after Gabby was shot, he got on a plane to Tucson, and that all changed.

Gabby, you served in state and then ran for Congress, where you worked for six years.

What's the best thing about Congress?

fast pace fast pace

So that's how you worked - yes fast pace

The expression is controversial, but

(Laughter) Admittedly, the legislative process is incredibly slow-paced, but my wife -- and I'll be honest, many members of Congress I know -- are working hard.

Gabby was running around like a madman and never took a single day off, and even if she did, she only got half a day off in a month.

Do you have solar panels installed in your home?

After a tragic incident, Mark, you decided to quit your astronaut career, even though your next space flight was just around the corner.

Everyone, including Gabby, tried to convince them to come back, and in the end, they did.

Well, the day after Gabby was shot, I called my boss, and I said to the lead astronaut, Dr. Peggy Whitson, and I said, "Peggy, I know we have three months left before we go into space.

Gabby's in a coma and I'm in Tucson.

Please find a replacement for me."

It wasn't that I quit being an astronaut, I just gave up on a job I had planned and NASA found a replacement.

A few months later, maybe two months later, I decided to go back to my old job. And when I became my primary caregiver, that's a big part of it. I'm sure some of you here have gone through it.

But I knew - yes, yes, yes

She was the biggest supporter of my career, so I knew what to do.

But Mark, I can't imagine how it felt to go to space. After all, Gabby -- on the third day of that mission, my wife wasn't just in the hospital. I was literally in the middle of a rendezvous with the space station, traveling at 18,000 miles an hour, and I was driving, looking out the window, looking at a computer, and Gabby had brain surgery. And that was the last surgery. It was a bone surgery, all over one side of my head.

For newcomers to our house in Tucson, it's customary for Gabby to pull a Tupperware from the top of the refrigerator and show her a real skull inside (Laughter).

Mark, is it an appetizer or a dessert?

It will be a topic of conversation

There's been a lot of talk about what Gabby did after Mark boarded.

You also had to muster up your own courage. Congress was in a deadlock again, and you left rehab to go to Washington. You went to the plenary session of the House of Representatives, you walked the floor -- I get so emotional when I talk about this -- and you voted for the vote, the deciding vote.

raising the debt ceiling

I voted on the bill, and just five months after that incident, I was bold enough to go back to work.

It was a controversial vote, but she wanted to go there and make her voice heard again.

And then he resigned and started on a very gradual and arduous road to recovery.

How are you spending your days?

This is Gabby's service dog, Nelson.

Nelson

A new family - yes, yes

Where Nelson was -- a prison killer -- apparently we like prisons (Laughter).

But she made me a fine dog.

Now he's a great service dog.

Gabby, what have you learned over the last few years?

What did you learn? - deeply deeply

Your relationship has deepened

That's right, you two are always together

Thankfully there is, isn't there?

appreciated

It's a picture of family and friends gathering together, and I like these pictures because they really show the relationship between Gabby and Mark.

As Gabby has said many times, your relationship has deepened in every sense of the word.

I believe that when something tragic happens in a family, it brings everyone together.

Here we are all watching the Space Shuttle fly over Tucson. This is the Endeavor, the last mission of which I was the commander.

Of course, you both overcame these challenges and had a gradual and difficult recovery. But Gabby, how did you manage to stay optimistically positive?

I want to make the world a better place

(Applause) That's exactly what you're saying. Recovery is probably the most important thing for both of you right now.

Both of you have worked hard for your country, and you're still doing it, and it's a new initiative, with a purpose.

Gabby what are you working on now?

“Americans Promoting Responsible Action”

Our Political Action Committee encourages members of Congress to think more about gun violence in the United States, and we work to pass appropriate legislation.

Yes, yes (applause) Gun violence has had a huge impact on us, but Gabby's case isn't the reason we're taking action.

It all started with a shooting in Newtown, Connecticut, that killed 20 first graders and kindergarteners.

So far, the public has done almost nothing.

we are trying to change that

There have been 11 mass shootings since Newtown, one school every week in January and February of last year.

There are other efforts to balance the rights and responsibilities of gun ownership, but what's different?

We are gun owners and we support gun rights.

But at the same time, I think we should do everything we can to keep it out of the hands of criminals and people with dangerous mental illnesses.

it's not that hard

This issue, like many others, is polarizing and political, but the debate in Washington wants to find a balanced solution.

Thank you both for your efforts.

This woman is brave and adventurous, so it's no surprise that she's always up for a challenge, and she seems to be able to do anything.

I'd like to introduce you to this video, the greatest adventure of all time.

see gabby

this was two months ago

are you OK? ok - great thank you

great great thank you

mountains great mountains

(Applause) As a side note, one of the people who flew with Gabby was a Navy SEAL, someone Gabby met in Afghanistan, when he was injured in combat and was very distressed.

Gabby went to visit him in Bethesda, Maryland, where he was going through a rough time.

he gradually got better

A few months later, Gabby was shot in the head, and in turn he supported her while she was hospitalized in Houston.

The two of us have a very good connection.

that's right

It is wonderful

So here we are at the TED stage, Gabby, and I hope you've come up with a message for everyone.

thank you

Hello everyone

Thank you for inviting me today.

It's been a long hard road, but I'm getting better

I'm doing my best.I'm undergoing various treatments.

my heart is stronger than ever

I'm still fighting to make the world a better place, and you can do it too.

Get more involved with your community

Lead by example

Give your passion, take courage

do your best thank you

(Applause) Thank you -- thank you.

(Applause) Thank you everyone - bye bye! (applause)

Tyler Edmonds Bobby Johnson Davonte Sanford Marty Tanklef Jeffrey Deskovic Anthony Caravella Travis Hayes

you probably don't know their faces

Together, they spent 89 years in prison for a murder they didn't commit because they falsely confessed to the murder when they were teenagers.

I'm a criminal developmental psychologist, and I study juvenile delinquency cases like this.

As a researcher, as a professor, as a new parent, my goal is to conduct scientific research to understand how children respond to legal systems designed for adults.

In March of 2006, police interrogated Brendan Dassey, a 16-year-old high school student with an IQ of about 70, within the range of mental retardation.

I'll show you a little bit from my four-hour interrogation.

(Cop 1) Brendan, be honest.

Like I said before, that's the only way to put yourself in a better position here.

I know what happened

(Cop 2) You've got to be honest - I'm your friend now, but let me believe you.

Mind you? you're nodding

tell me what happened

(Police 1) Mom said you would tell me the truth.

(Cop 2) No matter what you say here, your mother is on your side 100%.

COP 1: That's what your mother said, and she thinks you should know more.

(Cop 2) We're on your side.

(Police 1) We already know what happened. Tell me exactly, no lies.

CA: They told Brendan that if he was honest, he would be "free," but they were already convinced at that point that he was guilty.

And by being honest, I mean confessing. If Brendan confesses, he's never going to be free.

In the end, Brendan was forced to confess, incoherent and inconsistent with most of the physical evidence at the murder scene, which many believe to be a lie.

That was enough to get Brendan sentenced to life in prison for murder and sexual assault in 2007.

There was no physical evidence that Brendan was guilty.

By his own words alone, he spent nearly a decade in prison, until a judge overturned his sentence a few months ago.

The Dassey case is unique in that it was made into a Netflix show called "Road to Murderer."

The Dashey case is also unique in that it aroused a great deal of public outrage.

People were very upset about the way Brendan was being interrogated, and many thought that the interrogation he was being subjected to must be illegal.

It wasn't illegal

As a researcher in the field and familiar with police interrogation training manuals, I was not at all surprised by that footage.

In fact, the interrogation of Dashy itself is nothing special, and to be honest, I've seen it even worse.

I can understand people vehemently protesting that the Brendan Duthie case was unjust.

But let's not forget that roughly one million people in the same situation as him are arrested in the United States each year, and they may have been exposed to similar interrogation techniques, techniques that have been found to increase the likelihood of false confessions.

I think there are many people who have a hard time understanding the term "false confession."

I understand

It's so shocking and counterintuitive. Why would you confess to committing a horrific crime like rape, murder, and so on, and give horrifying details about it, if you really didn't?

I do not understand the meaning

In fact, we have no way of knowing how often false confessions occur.

But what we do know is that about 25 percent of the erroneous convictions of people who were later exonerated by DNA testing involved false confessions.

later found out to be innocent

In cases like this, there is DNA testing.

It's pretty clear that they didn't commit the crime, and yet a quarter of them confessed.

Now, a lot of research is starting to tell us why people make false confessions, and why certain people, like Brendan Dussey, are at greater risk of doing so.

Young people, in particular, have been found to be prone to false confessions.

For example, in one study of false accusations, only 8 percent of adults made false confessions, while 42 percent of minors made false confessions.

Of course, if we only look at cases where misjudgments and false accusations have been cleared, we can only know a limited amount of things.

For example, many cases are overlooked that are completed with just a guilty plea without going through a trial.

The TV and news headlines might make you think courts are the norm in justice, but the reality is that 97 percent of American lawsuits are settled by pleading alone, without trial.

97%

Even more overlooked are the lesser types of crimes confessed to, where DNA profiling is typically not used, and judgments are not followed by retrials or appeals.

That's why many say that the false confessions made public are just the tip of the iceberg.

Our research shows that teenagers have a surprisingly high rate of false confessions.

We interviewed nearly 200 incarcerated boys between the ages of 14 and 17, and 17% of them said they made at least one false confession to police.

What shocks most people is that in America, police are allowed to interrogate minors just like adults.

That's why the police can tell you lies, like, "I got your fingerprints," "I got your DNA," or "Your friends in the other room say it's all your invention."

For example, in England, lying to a suspect is prohibited, but in the United States, it's legal, even to someone with a mental disability, like Brendan Dussey.

In our study, most of the incarcerated teenagers we interviewed said they were subjected to oppressive questioning by the police without a lawyer or parent present.

More than 80 percent say they have been threatened by police that they could be raped or killed in prison or that they would be tried as an adult.

This "maximization strategy" is designed to make suspects believe that denial is meaningless and that confession is their only option.

You know the role of the good cop/bad cop, right?

this is the bad cop

Minors are more sensitive to social influences and are more susceptible to suggestions, such as very high-handed accusations and suggestions from authority figures during interrogations.

In our study, more than 70 percent of teenagers said police officers indicated they wanted to be "friends" with them or help them during interrogation.

This is called a "minimization strategy." It's a way of showing sympathy and understanding to the suspect, implying that a confession will lead to more lenient punishment.

If you apply police interrogation to the classic good cop/bad cop simplistic picture, this is the good cop.

COP 1: Brendan, you'll be better off if you're honest.

Whatever you've done, we can get through it together

I can't promise anything, but whatever you do, we're on your side.

(Malloy) "Whatever you do, we can get through it together."

Allusions to leniency, as you've seen, are particularly effective with minors, because they value rewards and risks differently than adults.

For suspects, a confession is a quick way to get paid off.

Because the stressful and uncomfortable interrogation is over.

Confessions seem to be the best option for many teenagers, often failing to consider the long-term risks that confessions may lead to future convictions and penalties.

Many of the teenagers you know aren't very good at making thoughtful, long-term plans.

I think the legal system generally understands that juvenile victims and witnesses need to be treated differently than adults.

But when it comes to minor suspects, being a minor is ignored.

Being interrogated like adults is a problem, because literally hundreds of studies in psychology and brain science show that minors think differently than adults.

Adolescent brains are different than adult brains -- anatomically, too.

During puberty, important changes occur in the structure and function of the brain, especially in the prefrontal cortex and limbic system, which are heavily involved in self-regulation, decision-making, emotional processing and control, and sensitivity to reward and risk, all of which influence behavior in stressful situations such as police interrogation.

We will need to educate police, lawyers, judges and juries about the developmental limitations of minors and how it can affect important interrogations.

In one national survey of police officers, 75 percent of them said they would like to receive special training to talk to children, boys and girls, but most of them have never been trained.

We also need to think of ways to provide extra protection for minors.

In a 91-page briefing, the judge who overturned Dassey's ruling earlier this year took issue with Dassey's lack of a parent or adult companion in the interrogation room.

This is what Brendan told his mother after confessing, apparently too late.

(Mother) What do you mean?

Brendan: I didn't do anything because the investigator told me otherwise.

(Mother) Didn't you?

Hey you?

(Brendan) It's a little different.

(Mother) What do you mean by "slightly different"?

(Brendan) I was tricked

MALLOY: Well, Brendan put it very well.

I don't know if the results would have been different if the mother had been with him in the interrogation room.

there would be a possibility

In our study, only 7 percent of incarcerated teenagers — many of whom had had multiple interactions with the police — had a parent or lawyer present when questioned as a suspect.

Very few children asked for the presence of a parent or lawyer.

We see the same thing in smaller things.

We conducted mock interrogations here at Florida International University, and of course we have parental approval and proper ethical review for minors.

We've rebuked teenagers and adults for cheating on their academic assignments -- for cheating academically -- and it's just as bad as cheating in the classroom.

In reality, the subjects were designed to witness the misconduct of another child, a probationary student, who was cooperating with the research team.

And they all had to make a difficult choice: lose the extra credit for participating in the research, or sue their peers.

Of course, in real life, that wouldn't be the case, but after the experiment, we revealed the species to all of our subjects.

But many teenagers, 59 percent, were held responsible for misconduct for not signing affidavits.

Only 3 out of 74 teenagers, 4% overall, asked to consult with their parents when accused of cheating, even though most had their parents in the next room during the experiment.

Of course, I know that cheating is very different from murder.

But it's interesting to note that a much higher percentage of teenagers than adults signed statements that they had cheated.

Even though they didn't, they still signed papers saying they had cheated without even trying to talk to any adult.

Other studies have shown the same results

Over 90% of minors have waived their Miranda rights and are subject to police questioning without a lawyer or parent.

In England and Wales, interrogation of minors requires the presence of an "appropriate adult," such as a parent, guardian or social worker.

This is not something that minors ask for -- and it's great because we know from research that they don't.

Now, here in the United States, just having minors in the presence of an appropriate adult isn't a complete solution to improving the way police interrogate them.

Unfortunately, most parents don't have the knowledge or understanding of the legal system to give their children proper advice.

Consider the "Central Park Five" case, where in 1989, five teenagers in the presence of their parents falsely confessed to a brutal gang rape.

It took more than a decade for their innocence to come to light.

The appropriate adult present should be a lawyer or a child's rights advocate.

In overturning Dassey's ruling, the judge noted that under federal law, police are not obligated to inform the parents of minors that they are being interrogated, nor are they obligated to have a parent present at the minor's request.

With all this in mind, think for a minute. In this country, minors are not allowed to vote, buy cigarettes, watch R-rated movies or drive cars, but they can decide to waive Miranda's rights. Studies show that many teenagers do not understand this right.

As for parental presence in the interrogation room, depending on the state you live in, your child may waive their rights without your knowledge and without consulting any adult.

Now, none of you -- including me, of course -- would want to interfere with the important investigative work that the police do every day.

But we should make sure that our officers are properly trained to talk to boys and girls.

As a parent and as a researcher, I think there is room for improvement.

We can get the information we need to solve crimes from children and teenagers, but we can take steps to prevent someone like Brendan Dussey from appearing.

thank you

(applause)

There's something I've been thinking about lately: the difference between virtues in resumes and obituaries.

The virtues of a resume are its contents Skills that can be used in the workplace

The virtues of eulogy are the words spoken in eulogy, the deeper humanity, the boldness, the affection, the authenticity, the consistency in dealing with people.

Most people would say that the words spoken in remembrance are more important.

At least in my case? no it's not

The person who got me thinking about this was Joseph Solovichik in his 1965 book, The Religious Lonely Man.

It says that people have two sides, "Adam 1" and "Adam 2" It says that people have two sides, "Adam 1" and "Adam 2"

"Adam 1" is a realistic, ambitious exterior.

It's the constructive, creative side of building companies and inventing.

"Adam 2" is humble

We try not only to do good deeds, but to be good people, to live introspectively, to honor God and His creations and the potential we have been given.

"Adam 1" wants to conquer the world

"Adam 2" follows the rules of the world

"Adam 1" emphasizes achievements

"Adam 2" emphasizes solidity and mental strength.

"Adam 1"

"Adam 2" asks why we live

The motto of "Adam 1" is "success"

The motto of "Adam 2" is "Love Redemption Return"

Solovetik says these two sides are at war with each other.

We are constantly questioning ourselves between our external success and our internal value We are always questioning ourselves between our external success and our internal value

The point to note about these two aspects is that the point to note about these two aspects is that they are based on different logic.

The extrinsic logic is economic, investment leads to results, risk leads to reward.

The inner dimension is moral logic and is often paradoxical.

you have to give in order to get

To get inner strength you have to surrender To get inner strength you have to surrender

To get what you want you have to overcome your desire

To make the most of myself, I need to lose myself

To discover yourself you must leave yourself

In our society, we tend to favor Adam 1 and ignore Adam 2.

As a result, we have become cunning animals, gamified life, ruthless, calculating creatures, humans who know the difference between ideal and reality, and who move between them.

I don't live an ideal life, I hope someone writes an ideal obituary

no depth of belief

no emotional richness

Even if it takes a lifetime, I won't put my heart into a task that won't end

What I've learned from history so far is how to build a solid "Adam 2" -- depth of character.

Throughout history, people go back to their pasts, sometimes to precious childhoods, sometimes to precious childhoods, to think about the past, to think about shameful acts, sins committed, selfish acts, negligent acts, shallow acts, anger, self-pity, flattery, lack of courage, and so on.

"Adam 1" is built on strength

"Adam 2" is built against weakness

A sin that I looked at myself and kept repeating — A sin that I looked at myself and kept repeating — From the sin that made me who I am, another is born, and from the struggle with sin, the struggle, the suffering, the depth of character is built.

We admit our guilt -- we admit our guilt -- our culture doesn't teach us how to face and fight that guilt.

We live in an "Adam 1 mind" culture, and we don't really talk about "Adam 2" in depth.

Finally, Reinhold Niebuhr summed up his life through the battles of Adam 1 and Adam 2 like this, summarizing his life through the battles of Adam 1 and Adam 2, "Because nothing of value can be accomplished in a lifetime, there is salvation in hope.

Because the beautiful and true things cannot be understood immediately in history, there is salvation called faith.

No matter how virtuous it may be, there is salvation called love, because you can't accomplish anything alone.

Our hubris that there is nothing more beautiful than our own virtuous deeds

Therefore, people are saved by the ultimate form of love, "forgiveness." Therefore, people are saved by the ultimate form of love, "forgiveness." Thank you.

(applause)

When I was born, there was only one book on parenting, and it was written by Dr. Spock.

(laughs) Thank you.

I wanted to try this joke

It's actually a book by Benjamin Spock called Dr. Spock's Parenting Book.

About 50 million copies were sold during the author's lifetime.

Today, as a parent of a six-year-old, when I walk into a large bookstore, this is what I see.

It's amazing, these shelves are lined with a wide variety of books.

A guide to eco-friendly parenting A gluten-free parenting guide A disease-free parenting.

There are even guides for growing bilinguals in families that speak only one language.

From our guide to raising financially smart kids, to how to raise science-minded kids and yoga masters.

Of course, there are no books to teach young children how to dispose of atomic bombs, but other than that, we have most of them.

All these books are published with good intentions.

I'm sure many of them are great books.

But overall, I'm sorry, but when I look at this shelf, what I see is not salvation.

Anxiety is there

There was a huge, colorful symbol of everyone's panic towering over me, and I wanted to know, why is it that raising our children involves so much anguish and confusion?

Why are we so confused now, when humans have been doing so well for thousands of years, long before there were parenting boards and research publications?

Why do so many mothers and fathers experience parenting as a kind of crisis?

"Crisis" might seem like an exaggeration, but the data suggests it's not.

In the 1957 paper, "The Crisis of Parenting," the aptly named article was published, and in the more than 50 years since then, there has been a great deal of research that has shown a clear pattern of parenting woes.

People with children are more stressed than people without children

Marriage satisfaction is low

There are a number of studies that have looked at parents' emotions when spending time with their children, but the results are often disappointing.

Last year, I spoke with a researcher named Matthew Killingworth, and his research is very inventive, tracking the well-being of people, and he said he'd found that "Friends interact better than spouses, spouses interact better than relatives, relatives interact better than acquaintances interact, acquaintances interact better than parents interact, parents interact with children. better than dealing with

Children are equal to strangers.”

(Laughter) But here's the point.

I've been looking at the evidence for this data for three years, and it's not the children that are the problem.

The problem is what's happening right now -- in parenting.

Specifically, no one knows what parenting is.

It wasn't until 1970 that the term "raising a child" entered common usage.

Roles as mothers and fathers have changed

Children's roles have changed

Right now, we're all desperately improvising our way out of an unscripted impromptu situation.

So how did this happen?

Why did we decide to steer parenting as we do now, with no standards to guide us?

The beginning was a big historical change

Until very recently, children worked mainly on farms, but also in factories and mines.

Children were considered an economic asset.

This system was abolished in what was called the Progressive Era.

They recognized that children had rights, banned child labor, and instead focused on education, making school their job.

I'm glad it happened

But this change has made the parent's role less clear than it used to be.

The old system had a mutual, if not moral, relationship.

Parents give their children food, housing, moral education, etc., and the children put money into the house in return.

The economics of parenting have changed since our children were no longer able to work.

In the words of one ruthless but brilliant sociologist, the existence of children since then has been, "Economically worthless, but emotionally of great value."

Instead of having their children work, parents started working for them, and the reason for this has become clear in the last few decades: if you want your children to succeed, school alone is not enough.

Now, extracurricular activities are a new addition to the child's job, but that's also the parent's job, because they're the ones who take them to soccer practice.

A mountain of homework is a child's job today, but it's also a parent's job, because there's a homework check.

About three years ago, a Texas woman said something that broke my heart.

She said lightly, "Today's homework is as much work as dinner."

The modern middle class spends all its time, energy and money on children, and even that middle class doesn't have as much as it once did.

In 1965, mothers today spend more time with their children than mothers did when most women were not working.

If parents knew what they were doing for their children, their role would be easier.

This is another factor that makes parenting today so incredibly complicated.

Even if parents have wisdom, they have no idea how that wisdom will be useful to their children.

The world is changing fast and unpredictable.

It was already like that when I was young

When I was a child, or more precisely, when I was in high school, it was said that in the new age of the global economy, if you can't do this, you won't be able to do anything about the Japanese language.

I apologize to the Japanese, but that didn't happen.

There are parents in the middle class these days who are enthusiastic about teaching their children Chinese.

In other words, since we can't predict the future, the best we can do as good parents is to prepare our children for whatever the future holds, hoping that at least one of our efforts will pay off.

I teach my kids to play chess in case they need analytical skills.

We're getting them into team sports in case they need the skills of cooperation.

For now, I'm going to be financially smart, science-minded, eco-friendly, gluten-free parenting.

Baby food was macaroni beef

and how am i alive

I pay my taxes

I have a stable job

Invited to give a talk at TED

But maybe what was good enough for me and my peers isn't good enough anymore.

So we rush to that bookshelf because we feel like there's something left unfinished, like we're not doing anything, like we're neglecting our obligations to our children.

As a modern mother and father, navigating is hard enough by itself.

Add to this the problem of steering as husbands and wives, because most women today have jobs.

I think this is another reason why parenting is so dangerous.

There are no rules, there are no scripts, there are no standards, and when you have kids, mom and dad have jobs.

Writer Michael Lewis used to put it nicely.

The surest way to start a marital quarrel is to go out to dinner with other couples who have a slightly different division of labor 'cause the conversation on the way home goes something like this: "Hey, did you hear that Dave said he's the one who drives the kids to school every morning?"

(Laughter) In this Brave New World, where there's no script, there's no set who's going to do what, there's going to be marital disputes, and both mothers and fathers will have legitimate grievances.

At-home mothers are more likely to multitask, and at-home fathers are more likely to do one task at a time.

If men were at home, they'd almost certainly be doing everything one at a time.

In fact, a recent study by UCLA looked at the most common middle-class family structures.

what do you think it was

"Papa was alone in the room"

According to the American Time Use Survey, mothers still spend twice as much time on childcare as fathers, better than in Irma Bombeck's time, but I think what she wrote still holds true today: "I haven't been able to go to the bathroom alone since October."

(Laughter) But it's important to remember that men do a lot of things, too.

Men today spend more time with their children than previous generations.

I really want to be a good, supportive father who works longer hours than my wife on average.

Today, it's fathers, not mothers, who most often complain about the difficulty of balancing work and life.

In any case, if solving this role problem is difficult for a traditional family, just imagine what it would be like for a non-traditional family: a family with two fathers, a family with two mothers, a single-parent family.

They're just surviving on the fly

If you look at more advanced countries, sorry for the cliche, but you know, in Sweden, parents can look to the government for help.

In some countries, mothers' and fathers' concerns and changing roles are acknowledged.

Unfortunately, the United States is not among them, Papua New Guinea and Liberia.

If you're wondering what we have in common with America, here's the answer: we don't have paid maternity leave.

There are eight countries in the world that do not have this system, and the United States is one of them.

In these turbulent times, there is only one goal that all parents can agree on, and that is that no matter whether you are a tiger mother, a hippie, or a helicopter parent, your child's happiness is priceless.

That's what it means to raise a child in an age where it's said to be economically worthless, but emotionally worth a lot.

Our job as parents is to nurture and protect our children's self-esteem.

There is a watchword that every parent should take for granted, "I have only one wish: I want my child to be happy."

Don't get me wrong, I think happiness is a great goal for children.

It's just that it's elusive

Teaching children happiness and self-confidence is not the same as teaching them how to cultivate a field.

It's not the same as teaching you how to ride a bike.

there is no curriculum

Happiness and self-confidence are by-products of doing other things and cannot be ends in themselves.

It is unfair to blame parents for their children's happiness.

It is even more unfair to blame children for their happiness.

I have something to tell you, which seems to lead to some very strange overthinking.

We're so insecure right now that we have to keep our children away from Sesame Street to protect them from the ugliness of the world.

I wish I was joking, but there's an early version of "Sesame Street" on DVD. I bought it because I was nostalgic.

(Laughter) I'll say it again.

The content of "Sesame Street" was originally inappropriate for children.

When asked by The New York Times what this meant, the show's producers offered a variety of explanations.

One of them, in one scene, Cookie Monster smoked a pipe and then swallowed it.

A bad example...isn't it?

The only thing that bothered me was the producer's words: I don't think I could have produced a twisted Oscar now because I have too many mental problems.

How many times have I been depressed thanks to you

(Laughter) In front of you, this is me, the person with the periodic table of the elements, featuring characters from The Muppets, on the wall of my office.

The problem child character of the example is there

this is my newborn son

I was in a morphine-ridden state.

I had a sudden caesarean section

Even though the sedatives left me dazed, I had a clear idea the first time I held my son.

I whispered it in my son's ear

"I will do my best not to hurt you."

It was the Hippocratic Oath. I didn't even know what I was saying at the time.

But now I realize that the Hippocratic Oath is a much more realistic goal than happiness.

In fact, as parents say, it's ridiculously difficult.

No parent says or does something that hurts enough to pray to God that it never happened.

I don't think there's ever been a time when we want more from ourselves than we do now. The important thing is that the next time you look at that bookshelf with your heart pounding, you'll remember that.

I don't know how to create a new standard that fits in today's world, but I do believe that in our desperate efforts to keep our children happy, we parents may be self-inflicted with false moral responsibilities.

I think a better goal, dare I say a better one, would be to work hard to raise a productive child, a moral child, and quietly hope that the child's good deeds, achievements, and parental love that they feel are given to them will be rewarded with happiness.

And that's what happens, after all, because there's no script.

Even if you don't have a modern version of the script, the book contains ancient teachings: courtesy, work, love, just follow them. Happiness and self-confidence will come naturally.

If all the parents did that, the kids would be fine, the parents would be fine, and maybe it would be a lot better for both of us.

thank you

(applause)

Now, I'm going to talk to you all about making artificial cells and printing life.

But before that, a little episode

On March 31, 2013, our research team received an email from an international health organization informing us that two men in China had contracted H7N9 bird flu and died shortly afterward.

There was a threat of a global epidemic, because the virus was beginning to spread rapidly across China.

We had the means to produce a flu vaccine and stop the epidemic, but it would take at least six months to have a vaccine ready.

Because the time-consuming, outdated method developed over 70 years ago was the only way to manufacture a vaccine.

The virus is isolated from the infected patient, packaged, and shipped to a facility, where scientists inject the virus into chicken eggs and spend weeks cultivating the virus in the eggs, thus beginning the multi-step, multi-month process of manufacturing a flu vaccine.

We got the email because we had just invented the biological printer, which can print vaccines instantly from manufacturing instructions downloaded from the Internet.

It could dramatically speed up the flu vaccine manufacturing process, potentially saving many lives.

Biological printers will enhance our ability to read and create DNA, and we'll also see what we call "biological teleportation."

I'm a biologist, an engineer, and I make things out of DNA.

Believe it or not, one of my favorite things to do is cut DNA and put it back together to understand how it works.

DNA can be edited and programmed like computer code.

The apps I make are unique

I create life

It's like self-replicating living cells, vaccines and therapeutic drugs that work in ways that weren't possible before.

Here you can see the National Medal of Science winner Craig Venter and the Nobel laureate Hamilton Smith.

they have a common vision

Since the functions and characteristics of all living organisms, such as viruses and living cells, are programmed in DNA, if we can read and write that code, we should be able to reconstruct it even at great distances.

This is what we mean by "biological teleportation."

To prove this vision correct, Craig and Hamilton set the goal, for the first time, of creating an artificial cell from the DNA code on a computer.

As a scientist looking for a job in cutting-edge research, nothing is more intriguing.

(Laughter) Now, by genome, I mean all of the DNA inside an organism.

The Human Genome Project, completed in 2003, was an international attempt to uncover the complete genetic code of mankind, and in the wake of that, a revolution in genomics occurred.

Scientists became adept at reading DNA.

To determine the A, C, T, G base sequences of organisms.

My research, on the other hand, is quite different.

I had to become proficient in the art of making DNA.

Like a writer, you start out by writing short sentences of DNA, then paragraphs, and then you end up with a whole novel of DNA, creating the biological instructions for making proteins and living cells.

Living cells are nature's most efficient machines for creating new products, and they represent 25 percent of the total pharmaceutical market, worth billions of dollars.

If cells can be programmed like computers, DNA fabrication will further advance the bioeconomy.

We knew that biological teleportation would also be possible.

It's about printing the biological material that DNA describes from DNA.

As a first step towards realizing this dream, our research team set out to create the world's first artificial bacterial cells from DNA information on a computer.

Artificial DNA is a commercial product

There are a number of companies that contract to make short pieces of DNA, starting with these four vials containing the chemicals G, A, T, and C, which are the building blocks of DNA, and they'll make short pieces of DNA for you.

For the past 15 years or so, our team has been developing techniques for piecing together short pieces of DNA to create complete bacterial genomes.

The longest genome is now over a million characters long.

That's twice as long as your average novel, but you had to make it without a single letter error.

This was made possible by developing a method, which I would like to call "single-step ex vivo isothermal reconstitution," which --

(Laughter) Surprisingly, the scientific community didn't like the technically accurate name, so they dubbed it "Gibson Assembly."

It's now a standard technique used in laboratories around the world to make DNA of varying lengths.

(Applause) Now that we can chemically synthesize the bacterial genome, the next challenge is to use it to create a living cell capable of self-renewal.

Our approach is to view the genome as the operating system of the cell, and the cell as the hardware required to run the genome.

Through a lot of trial and error, we've developed a way to reprogram cells, and even replace the genome of a cell with that of another cell, so that bacteria can turn into a different species.

This genome-transplantation technology paved the way for the activation of genomes engineered by scientists rather than mother nature.

In 2010, we announced that we had created the first-ever artificial cell by mobilizing all the technologies we had developed to read and create DNA, and we announced that we had created the first-ever artificial cell, which we named "Synthia" this time.

(Laughter) Since the first bacterial genome was sequenced in 1995, thousands of bacterial genomes have been fully sequenced and stored in computer databases.

Our work on artificial cells proves that this process can be reversed, taking a complete bacterial sequence out of a computer and converting it into a living, self-replicating cell with all the expected characteristics.

It's understandable that there are safety concerns about doing this level of genetic manipulation.

While this technology has the potential to be very useful to society, it can also cause harm.

With this in mind, even before we began our first experiments, we began working with the public and governments to find ways to responsibly develop and regulate this new technology.

One of the conclusions of such discussions is to scrutinize all orders for DNA synthesis and their orders to ensure that no pathogens or toxins are created by the bad guys or accidentally created by scientists.

All suspicious orders are reported to the FBI and other relevant law enforcement agencies

Artificial cell technology will be the engine of the next industrial revolution, transforming industries and economies in ways that will help solve global sustainability challenges.

the possibilities are endless

For example, clothes made from renewable biological resources, cars powered by biofuels produced by synthetic microbes, plastics made from biodegradable polymers, and bedside printing of customized treatments for patients.

Our great effort to create artificial cells has put us at the cutting edge of DNA fabrication.

In the process, we've found ways to make DNA faster, more accurately, and more reliably.

Because of the robustness of these techniques, we realized that we could automate the manufacturing process so that machines could do what scientists used to do manually in the lab.

In 2013, the first DNA printer was completed.

It's called BioXp

This device is essential for making DNA in the many applications that we and researchers around the world are working on.

Shortly after BioXp was completed, I received an email about the H7N9 avian flu threat in China.

A team of Chinese scientists had already isolated the virus, sequenced its DNA, and posted it online.

We downloaded the DNA sequence at the request of the U.S. government, and in less than 12 hours, we printed it on BioXp.

Collaborators at pharmaceutical company Novartis quickly turned this artificial DNA into a flu vaccine.

Meanwhile, the U.S. Centers for Disease Control and Prevention had been waiting for virus samples from China, as they've done since the 1940s, and were ready to start the chicken egg method.

For the first time in history, we were able to produce a vaccine against a new and potentially dangerous strain of virus before it became an epidemic, and the U.S. government ordered it for stockpiling.

(Applause) It was only then that I truly understood the power of biological teleportation.

We really came to understand the power of biological teleportation, and partly because of this, it was a natural progression for us to start building biological teleportation devices.

This device is called DBC

Abbreviation for Digital-Bio-Converter

Unlike BioXp, which is based on short pieces of pre-made DNA, DBC starts with digitized DNA and transforms it into biological entities -- DNA, RNA, proteins, and even viruses.

BioXp is a DVD player where you have to put a physical DVD in, whereas DBC is Netflix.

To create the DBC, a team of scientists worked with software engineers and instrumentation engineers to integrate all of the multiple laboratory processes into one device.

These include software that predicts the DNA that will be made, chemistry that breaks the building blocks of DNA, Gs, A, Ts, and Cs, into short pieces of DNA, Gibson assembly that joins the short pieces into longer ones, and biology that transforms DNA into biological entities such as proteins.

this is the prototype

It looks good and works well

Created therapeutic drugs and vaccines

A process that used to take weeks or months in the lab can now be done in just a day or two.

It works completely without human intervention, and can be activated by an email sent from anywhere in the world.

We often liken the DBC to a fax machine.

When you fax, you receive images and documents, but when you receive DBC, you receive biological material.

If we look back at the evolutionary history of the fax machine,

A prototype built in the 1840s was so different from the modern one that it didn't look like a fax machine.

Even in the 1980s, most people didn't know what a fax machine was, but even if they did, the concept of instant playback of images on the other side of the world was hard to grasp.

Now, with all the functionality of a fax built into our smartphones, we all take this high-speed exchange of digital information for granted.

The current DBC looks like this

DBC will evolve like the fax

We are working to make our equipment smaller, to make the underlying technology more reliable, cheaper, faster and more accurate.

Accuracy is extremely important in the creation of artificial DNA, because a single letter error in DNA can render a drug ineffective or lead to the death of an artificial cell.

DBC helps distributed manufacturing of drugs made from DNA

Hospitals around the world will be able to use DBC to print personalized medications at the bedside.

In fact, I think the day will come when it will be commonplace for people to connect DBCs to their home computers and smartphones and download prescriptions for insulin and antibody therapy.

It would also be useful to have DBCs in strategic locations to respond quickly to epidemic outbreaks.

For example, the Centers for Disease Control and Prevention in Atlanta, Georgia, could send a prescription for a flu vaccine to DBC on the other side of the world to manufacture the vaccine on the front lines of an epidemic.

Influenza vaccines can also be tailored to local strains of the virus.

Many lives could be saved by sending vaccines to different locations as digital files instead of storing them and shipping them.

Of course, the application can be anything imaginable.

It's not hard to imagine putting DBCs on other planets.

A scientist on Earth could send a digital prescription to an alien DBC to create new medicines, or create artificial life forms that generate oxygen, food, fuel, building materials, and so on, so that humans can transform the planet into a more habitable one.

(Applause) Digital information travels at the speed of light, so it only takes a few minutes to get a prescription from Earth to Mars, but it would take months to physically deliver the same sample on board a spacecraft.

But for now, I'm happy if I can save lives from outbreaks of epidemics by fully automated, on-demand, instant delivery of new drugs around the world, and print personalized anti-cancer drugs for patients in desperate need of time.

thank you

(applause)

this universe is full of planets

In the next 10 years, I'd like to discover Earth-like planets -- in the next 10 years, discover Earth-like planets -- and develop a space telescope that can see if there's life.

We're working with members of the NASA Jet Propulsion Laboratory and Princeton to develop these technologies.

Astronomers say that every star has at least one planet, and astronomers say that every star has at least one planet, and one-fifth of them are estimated to be life-inhabitable, Earth-like planets.

But we haven't seen it yet, we only indirectly detected it.

Here's a photo of NASA's famous blue dot.

This is NASA's famous photo of the pale blue dot. In 1990, the Voyager space probe photographed Earth from outside our solar system, six billion kilometers away.

I want to photograph another Earth-like planet, like this one. I want to photograph another Earth-like planet, like this one.

Why is it so difficult?

Why is it so difficult? Let's say you put the Hubble Space Telescope in orbit of Mars, let's say you put the Hubble Space Telescope in orbit of Mars.

Earth looks a little blurry like this Earth looks a little blurry like this because the telescope is too small compared to the orbit of Mars because the telescope is too small compared to the orbit of Mars.

Let's move into the orbit of Uranus, which is 10 times further away.

Let's move into the orbit of Uranus, which is 10 times further away.

It's getting smaller and you can't see the details. The moon still looks small.

It's getting smaller and we don't know much about it. The moon still looks tiny, but if you move 10 times further away into the Kuiper Belt, at the outer edge of the solar system.

If you move to the Kuiper belt, which is 10 times further away, at the outer edge of the solar system

Almost no statue this time, by Carl Sagan.

Almost no statue this time, by Carl Sagan.

Let's move to the Oort Cloud, which is ten times further away.

Let's move on to the Oort Cloud, which is 10 times further away. It's outside our solar system. The sun is in sight and overlaps the planets.

On Alpha Centauri, ten times further away,

Ten times further away, Alpha Centauri, which is the closest star to the sun, has lost its planet.

All you see is starlight that's 10 billion times brighter than the planets All you see is starlight that's 10 billion times brighter than the planets There should be a planet in the red circle, but it's hard to find.

There's supposed to be a planet in the red circle, but it's hard to find this one.

Light from stars diffracts and scatters inside the telescope.

The light from the star diffracts and scatters inside the telescope, which makes the image too bright and we can't see the planets.This makes the image too bright and we can't see the planets.

To see the planets you have to remove this light To see the planets you have to remove this light

To see the planets, you have to remove this light.

I'm going to show you one of these, and I'm going to show you one of these technologies that will be able to capture Earth-like planets, probably in 10 years.

It was invented by Lyman Spitzer, the father of space telescopes, in 1962. It was invented by Lyman Spitzer, the father of space telescopes, in 1962. It was inspired by the eclipse, a phenomenon that you may have seen.

It's inspired by the eclipse, a phenomenon you've seen, like the solar eclipse.

because the moon moves in front of the sun and blocks the light

The moon is moving in front of the sun, blocking the light, so we can see the corona around us.

It's like if you block the spotlight from your eye with your thumb, and you can see the person behind you if you block the spotlight from your eye with your thumb.

It's the same as seeing people in the back seat. What's going on?

The moon is casting a shadow on the earth The moon is casting a shadow on the earth

If you put a telescope or camera in the shadow and look at the sun from there, if you put a telescope or camera in the shadow and look at the sun from there, it removes most of the light and gives you a detailed look inside the corona.

Spitzer's idea is to do this in space.

We build a big screen and steer it in space. Move it in front of a star and block most of the light. Move it in front of a star and block most of the light. If you put your telescope in the shadow it creates, you can see the planet.

should look like this

You can't find planets on a screen this big, you can't find planets on a screen this big. Unfortunately, this doesn't work very well, because the light waves are diffracting around the screen, because the light waves are diffracting around the screen.

It's like the water in a river rushing over rocks, because the light casts out the shadows, and you can't see the planet.

The light casts out the shadows, and you can't see the planet with this.

But Spitzer knew what to do

If you blur the boundary and reduce diffraction, you can see the planet If you blur the boundary and reduce diffraction, you can see the planet If you blur the boundary and reduce diffraction, you can see the planet Over the last 10 years, we've found the best way to do this.

This is what I call the Petal Starshade.

This is what I call the Petal Starshade.

You can control the diffraction by standing upright and reshaping the petal ends.You can control the diffraction by standing upright and reshaping the petal ends.You can control the diffraction by standing upright and reshaping the petal ends.

We got good shadows, about 10 billion times darker, and we could see the planet.

the size of the star shade

Of course, it's bigger than your thumb, and it's about half the size of a football field. Of course, it's bigger than your thumb, and it's about half the size of a football field.

It might seem daunting, but the good guys at the NASA Jet Propulsion Laboratory invented a great design. The good guys at the NASA Jet Propulsion Laboratory invented a great design.

From this coiled state, separate from the telescope.

From this coiled state, separate from the telescope.

The petals spread and the telescope rotates The petals spread and the telescope rotates

You can see it jumping out of the telescope to the point of 50,000 km You can see it jumping out of the telescope to the point of 50,000 km

It moves in front of the star like this and creates a nice shadow It moves in front of the star like this and it creates a nice shadow

We were able to see planets in orbit. (Applause)

(Applause) Thank you.

It's not sci-fi, I've been working on this development for five or six years.

It's not sci-fi, I've been working on this development for five or six years.

Last summer in California, I had a great test Last summer in California, I had a great test

A miniature version of the Starshade with four petals.

A miniature version of the Starshade with four petals.

It's about half the size

The flower petals are expanding, made by four undergraduate interns.

Flower petals are spreading Made by four undergraduate interns Flower petals are spreading Made by four undergraduate interns

The petals have to rotate and get into the correct position.

The petals have to rotate and get into the correct position.

The base of the petal needs to move to the same place every time by 0.1 mm The base of the petal needs to move to the same place every time by 0.1 mm The base of the petal needs to move to the same place every time by 0.1 mm

Accurate movement in units of 0.1 mm was possible in all 16 tests. Movement in units of 0.1 mm was possible in all 16 tests. Accurate movements in units of 0.1 mm were possible in all 16 tests.

We have to do it accurately, if we can establish this technology and apply it to space, we have to do it accurately, if we can establish this technology and apply it to space, we might be able to see things like this, we might be able to see things like this.

A picture of the star closest to the sun taken by the Hubble Space Telescope A picture of the star closest to the sun taken by the Hubble Space Telescope

If you use a space telescope that's a little bit bigger, a space telescope that's a little bit bigger, and you put a shader in front of it, it might look like this.

This is a family photo of our solar system, but what we want to see is another solar system.

You can see Jupiter, Saturn, Uranus, Neptune, etc. You can see Jupiter, Saturn, Uranus, Neptune, and so on.

If we can find this, if we know if there's water or oxygen or ozone there, if we can find this and if we know if there's water or oxygen or ozone there, we might be able to confirm the existence of life.

I think this is the most amazing thing science can do, and that's why we're doing it.

I think this is the most amazing thing that science can do, and that's why we're doing it, because we think it's going to change the world.

Because I think this will change the world, because when you see the planet, everything changes.

thank you

(applause)

we consume a lot of type

It's a reality you can't escape no matter where you are

But almost no one wants to know: Where did a typeface come from, when did it come from, and who designed it? Was it created by humans in the first place, or was it created by software?

But I'm interested in that sort of thing

because it's work

I'm one of the few people who would go mad because they don't like the spacing between the "T" and the "e."

remove the slide

It's unbearable for me and Chris.

It's OK

Now, what I'm going to talk about is the relationship between technology and type design.

Since I started this job, I've gone through a lot of technological transformations, like typesetting, digital desktops, screens, web.

Through repeated experiences of change, I've tried to understand what it means in design.

In this slide you can see how the tool affects the shape.

There are two K's. The K on the left is modern. It's computer generated.

All straight lines are straight

The curves have a mathematical smoothness to them because they use Bezier curves.

The one on the right is the old Gothic script, hand-carved in iron, a very durable material.

no straight line is straight

curves are delicate

These letters have a handcrafted brilliance of life that cannot be captured by machines or programs.

what a difference

But it's all a lie

I lied to you at TED. I'm sorry.

In fact, both were created using the same computer, the same software, the same Bézier curves, the same font format.

The one on the left was made by Susana Ricco of Emigre, and the one on the right was made by me.

Same tools, different fonts

The reason why the font is different is that the designer

Because it's different Susana is made like the one on the left

I wanted it to look like the one on the right, that's all

Type is adaptive

Unlike art, such as sculpture or architecture, you can't tell how to create something by looking at the print.

I consider myself an industrial designer

The things I design are printed, they're read, they convey meaning.

not just that

There is also an aesthetic element

Why are two letters different depending on the interpretation of each designer?

Why does the work show the designer's style? It's the same with the work of fashion designers and automotive designers...

Certainly, as a designer, sometimes I feel the influence of technology.

This is from the mid-'60s, when metal type was replaced by phototypesetting, the transition from casting to photography.

Phototypesetting was useful, but it also had a major drawback: it was a system with only 18 units for arranging letters.

At that time, I received a request to design a series of condensed sans-serif fonts, and they wanted me to create as many types as possible within the 18-unit range.

When I looked at the calculation results, I quickly realized that I could only make three types.

Helvetica Compress Extra Compress — The Ultra Compress design challenged an 18-unit system

It was as if the system was dictating the proportions of the typeface.

We only have a lowercase typeface here

You might be thinking, "I'm sorry, but I couldn't overcome the problem, and this is what happened."

I hope not

If I took the same job now, I would have 1,000 instead of 18 units.

We could make more typefaces, but would that make these three types any better?

We won't know until we try it, but I don't think 1,000 to 18 will get better.

My gut feeling is that it's going to be little if any better, because these typefaces were designed for the system, and the type adapts to that.

I don't know how to make it even if I see the print

Industrial Designers Must Have Constraints

it's not art

Should you compromise just because you have a constraint?

Will accepting the constraints lower the bar?

No, I'm Charles Eames

I'm encouraged by the words, "I'm conscious of the constraints in my work, but I don't compromise."

It's true that the line between constraints and compromises is very fine, but the distinction is very important in the way I approach my work.

Do you remember when you used to use this?

It's a phone book. Let's leave the screen as it is so that everyone can immerse themselves in nostalgia.

This is an early prototype of a Bell Centennial that I designed for telephone directories in the mid-'70s.

Telephone directories are printed on newsprint in very small letters using lamp black and kerosene ink on a super-fast rotary press.

It's not a boon for type designers.

The challenge for me was designing a typeface that would print well and be legible in the most demanding conditions.

At that time, it was the dawn of the digital type.

All the letters were handwritten on graph paper.The Bell Centennial had four weights, but I handwritten them pixel by pixel and encoded them line by line.

It took me two years to work on it, but I learned a lot.

This letter looks like it's been nibbled by a dog or something, but the missing pixels where the strokes intersect and diverge is the result of studying how ink bleeds on cheap paper, and refining the font accordingly.

I designed this strange typeface, taking into account the size of the letters and the influence that comes from the production process.

AT&amp;T, on the other hand, was trying to use Helvetica for their phone book, but as my friend Eric Spiekerman said in the movie "Helvetica," the typeface was designed so that each letter looked as similar as possible.

Readability in small fonts is not the goal

When you look at the slide, it's very elegant.

On the other hand, I needed to make the letters more distinguishable, so in the Bell Centennial I widened the letter shapes a bit, as you can see at the bottom of the slide.

Then in the mid-'80s -- digital outline fonts -- the dawn of vector technology.

The problem at the time was the data size of the fonts, the amount of data required to locate and store the fonts in computer memory.

Because of that, there was a limit to the number of fonts that could be used in a typesetting system.

I analyzed the data and found that a typical serif font, like the one on the left of the screen, requires about twice as much data as a sans-serif font in the middle, because of the points needed to define the graceful curves at the ends of the characters.

By the way, the numbers at the bottom of the slide represent the amount of data needed to remember each font.

So the middle sans-serif has 81 data, which is far less than the serif's 151.

So I thought, "Engineers have a problem.

It's the designer who saves it."

So I made the one on the right — a serif without curves.

The serifs are composed of polygons, or straight lines, and the curved parts are chamfered.

This reduced the data to a sans-serif font.

We called this a charter

I took the data size value and proudly went to the tech chief and said, "We've fixed the problem."

And the chief asks, "What's the problem?"

So I explained, "Something like the amount of data needed for a sans-serif typeface."

He replied, "I fixed the problem last week.

I used a data compression routine to reduce the data size by an order of magnitude.

Now you can have as many fonts as you want on your system."

I had no choice but to say, "I see, thank you."

fail again

I found a design solution, but the technical problem was already gone.

But here's where it gets interesting

I didn't throw this design in the trash

I kept it

It started as a technical exercise, but it became an aesthetic exercise.

In short, I like this typeface

I don't care what the reason is

i like the design itself

There's a kind of candor and brevity to Charter's simple form, and I was comfortable with that.

In the midst of technological innovation, designers try to be influenced by the atmosphere of the times.

We designers respond to the air of the times and pursue new things.

Charter is kind of a metaphor for me.

In the end, there was no clear cause-and-effect relationship between charter design and technology.

I misunderstood technology

Yes, it was the technology that gave me the hint, but I wasn't bound by it, and that's what happens all the time.

Technicians are very quick minded and I'm a bit slow, so it's stressful, but it's fun to work with them and learn from them.

So in the mid-'90s, I started working with Microsoft on screen fonts.

Up until then, all screen fonts were reusing print fonts.

Microsoft, on the other hand, got the trend right: the rapid shift to electronic communication, reading and writing on screens, and the declining importance of print.

At that point, my priorities were about to shift.

Microsoft didn't want a repurposed font, it wanted a new design, one that could handle the display challenges of low-resolution displays.

I told Microsoft, "A typeface designed for a specific technology will eventually become obsolete.

I've designed many typefaces to solve technical problems.

Thanks to the technicians, the problem was solved, but

At the same time my typeface disappeared

It was just a means of connecting."

Microsoft's response was that it would take 10 years to develop a monitor with higher resolution and lower price.

When I heard that, I thought, "10 years isn't bad. It doesn't seem like it will end as a transition."

I was persuaded to start working, and when Verdana and Georgia were born, this was the first time I didn't use paper and made every last pixel on the screen.

At that time the screen was "binary"

pixels only had on and off

This is the outline of a capital "H." It's a black outline, but it's stored in memory like this. Underneath that is a bitmap in gray. On the screen, this is what you see.

Bitmaps are generated from outlines

The "H" is composed only of straight lines, so the bitmap and the outline almost match on the grid.

On the other hand, in the case of "O", that is not the case.

It looks more like bricks than letters, but it's a valid bitmap for the simple reason that it's symmetrical about the x and y axes.

Binary bitmaps can't ask for more

For difficult letters, like the lowercase letter "a," I would make three or four different letters, and then stand back and look at them to choose the best one.

No, rather than the "best" character, I was trying to use my designer's intuition to determine the "least bad" character.

is this a compromise

I don't think so. We're just following the highest technically possible standards at the time, just that those standards are far from ideal.

What you're seeing are both bitmap fonts.

The "a" above is better than the one below, but it's not the best by any means.

You might be able to see the effect better if you make the text smaller.

I'm not an idealist, I'm a realist, but I needed to be.

I find satisfaction in doing things to the best of my ability, even though my personality doesn't allow me to do it perfectly.

This is a lowercase "h" in Georgian Italics.

Bitmap is jagged

gives a rough impression

But after playing around with it, I found that there's an optimum slant that makes the strokes look neatly separated at pixel boundaries when italic is displayed on the screen.

Look at it, it may be rough, but the left and right leg parts are on the same line and look separated.

This is a triumph of design

Of course, if you go even smaller, your options are limited.

This is an "S" Can you see?

It's been 18 years since Verdana and Georgia were released.

Microsoft was right, it took a full decade, but today's displays have better spatial resolution thanks to things like anti-aliasing, and much better photometric resolution.

They've achieved their goal, but does that mean that the screen fonts I once designed for low-resolution displays are gone?

Or will the fonts outlive the already obsolete displays and the new web fonts flooding the market?

Or will it find its own evolutionary position away from technology?

In other words, will it become mainstream in type design?

I don't know, but so far it's been working fine.

It's been 18 years.

Thank you very much

(applause)

I was very fortunate that my first job was a retrospective of the painter Elizabeth Murray at the Museum of Modern Art in New York.

I learned a lot from Murray

After curator Robert Stoor selected the works for display from among Murray's entire lifetime, I was obsessed with his work from the 1970s.

Some of its motifs and elements would reappear later in her life.

I remember asking her what she thought of her work at the time.

It's a work that people who don't know can't believe it's hers.

She said, "There are a few things that are not up to the standard of what I want."

In fact, one of them fell far short of her standards, and she left it in the atelier's garbage can, only to be picked up by a neighbor who appreciated the work.

That moment changed the way I thought about success and creativity.

Success is a moment, but I've found that it's always creativity and mastery that we celebrate.

So what does it take to turn success into mastery?

This is a question I have been asking myself for a long time.

I think it starts with us honoring the gift of "just one more step."

I started to understand this one cold day in May when I went to see the national archery team.

What I wanted to see was what's called the archer's paradox, the paradoxical idea that you have to aim a little off in order to actually hit the target.

I watched as the coaches drove the players out in silver vans, looking calm and focused.

One player had half-eaten ice cream in one hand and an arrow with yellow feathers in his left hand.

The athletes were smiling when they passed me, but they made me an assessment and headed to the shooting range.The athletes were discussing how they were going to hit the target using numbers and postures that seemed to be angles, not words.

As the coach looked at the players, trying to figure out who needed help, I was standing behind them, looking at a player.

Aiming 75 yards (70 m) away, the 10-point scoring strip is about as small as the head of a matchstick at the end of your arm at full stretch.

And then you aim with a bow that loads 50 pounds (23 kg) each time you shoot it.

She hit the first 7, followed by 9, then two 10s, and the next arrow missed the target.

The removal gave her even more tenacity, and she continued to shoot many times after that.

This went on for 3 hours

After practice, one athlete, exhausted, lay on the ground, sprawled, looking up at the sky, looking for what T.S.

It's very rare to see such rigorous perseverance in modern American culture, which has become so largely irrelevant to its mission, three hours of adjusting its posture to hit its arrows, secretly pursuing some kind of excellence.

But I stayed still, because I thought I was witnessing the difference between success and mastery, which is rarely seen now.

Success is getting a 10, but mastery is knowing it's pointless if you can't repeat it over and over again.

But proficiency is not the same as excellence

It's also different from success. It's not about a moment in time or a label that the world gives us.

Mastery isn't about reaching a goal, it's about cutting yourself to keep pursuing it.

To do that, what we need to do is to respect the "next step" to push harder.

There are countless examples of works that others have labeled as classics and masterpieces, but whose authors consider them completely unfinished, riddled with problems and shortcomings, in other words, "one step closer."

For me, Elizabeth Murray's confession about her early work came as a surprise.

Considering his work incomplete, the painter Paul Cézanne often deliberately set it aside with the intention of resuming it someday, so that in his lifetime he signed only 10% of his work.

He loved Honoré de Balzac's novel, The Unknown Masterpiece, and he felt like himself in its protagonist.

Franz Kafka saw imperfections in the midst of rave reviews about his work, so when he died, he asked that all his diaries, manuscripts, letters and sketches be burned.

My friend declined this request, and that's why today we have all of Kafka's works. "America," "The Trial," and even "The Castle."

The quest for mastery is, in other words, just a little bit more to keep moving forward.

"God, please allow my desires to exceed the limits of my power." Michelangelo's plea seemed to be addressed to the god of the ceiling painting of the Sistine Chapel. Even if I stretched out my finger, I could not reach God's hand. That form of Adam was probably Michelangelo himself.

Mastery lies not in attainment, but in reaching out

It's about continuing to seek to close the gap between who you are now and who you want to be.

Mastery is devoting everything to your craft, not your career.

Many inventors and entrepreneurs have experienced this phenomenon.

You can see it in the life of the indomitable Arctic explorer Ben Saunders, who says his achievements are the result of "one more step" rather than a mere achievement.

We fight our limits and grow

Duke Ellington knew that, and he always said that his favorite thing in his repertoire was his next album, always his next song.

The reason why "one more step" is included in proficiency is that as you progress, it becomes clear that you don't know anything about the things you thought you knew.

This is called the Dunning-Kruger effect.

In an interview with The Paris Review, James Baldwin was asked, "What do you think increases with knowledge?"

I replied, "Remember how ignorant you are."

Success motivates us, but "next step" can be the driving force for endless pursuit.

One of the most obvious examples of this is the difference between silver and bronze medalists after the Olympics.

When Thomas Gilovich and a team of researchers at Cornell University studied this difference, they found that while bronze medalists were more likely to be relatively satisfied with avoiding a medalless fourth place finish, silver medalists were dissatisfied, and that dissatisfaction drove them to target the next event.

The gambling industry took notice of this "one more step" phenomenon, realized this "one more step" phenomenon, and created instant lotteries with higher-than-normal odds of one step away.

The reason we're driven to take the next step is that it changes the way we look at things and puts goals that we would normally put far away right next to where we are right now.

If I asked you guys to describe the best day of the week, you'd give me a rough outline.

But if I asked you to describe your best day at TED tomorrow, I'd be very detailed, realistic, and very clear.

This is the "next step" job

It's the feeling that it's so close that it motivates me to get serious about planning now.

Jackie Joyner-Kersey missed out on gold in the 1984 heptathlon by a third of a second, but her husband predicted that this would give her the tenacity she needed at the next competition.

In 1988, she won the gold medal in the heptathlon, setting a record of 7,291 points, a score far behind any athlete to this day.

We grow not when we've done it, but when we leave it to do.

I'm standing here and I'm thinking, even in this room alone, there are many different ways to create "one more step". How will it affect your life?

We know that we grow when we struggle with our limits, which is why deliberate imperfection is built into the creation myth.

In Navajo culture, artisans and women intentionally imperfect textiles and ceramics.

It's called the "way of the soul," a deliberate flaw in the existing mold that gives creators a way out and a reason to keep working.

A master is different from a master, he takes his work to the end of the concept.

The reason a master is a master is because he knows there is no end.

And as I was thinking about that, I suddenly realized why that archery coach told me after practice that he didn't want the players to hear me. Neither he nor his fellow coaches felt like they were doing enough for their team. They never thought their visualization skills were good enough.

He wasn't complaining, he was just confessing to me, and it made me realize once again that he knew no bounds and was ready to give his all to the bumpy road, always looking to rise.

We're built on rough thinking, including our past selves.

This is the power of mastery

By getting closer to what you thought you wanted, sometimes you reach more than you ever dreamed possible.

I can't help but imagine that's what Elizabeth Murray was thinking, smiling at her early work in that gallery.

Even if a utopia is completed, there will still be imperfections there.

Completion is the goal, but I don't want to think of it as the end.

thank you

(applause)

wow how bright

I'm sure it consumes a lot of electricity

I'm sure you've expended a lot of energy to get here.

The world needs a lot of energy, and for now we're getting this from fossil fuels.

I used to burn gas

I've done well, so

I have the life I have now, but I have to stop now.

I can't do it anymore

We're experimenting with different types of energy there. We're experimenting with different types of energy there.

I prefer nuclear energy

It's very concentrated energy, it's a solid, reliable source of energy, and it's carbon-free.

There are two known forms of nuclear energy: fission and fusion.

Nuclear fission is the splitting of a large atomic nucleus into two, producing large amounts of energy, and is the principle of nuclear power generation today.

going very well

Next is the story of nuclear fusion

my favorite much better

It's pretty cool when you put two tiny nuclei together to make helium.

produces large amounts of energy

This is how nature produces energy

The sun and stars that exist in space shine through nuclear fusion.

Fusion reactors will be very economical, and they can be expected to be very safe.

Only radioactive waste with a short half-life remains, and the reactor will not melt.

fuel can be taken from the sea

The cost of extracting the fuel is really cheap, about a thousandth of a cent per kilowatt-hour.

Even if the whole world were to generate energy solely from nuclear fusion, we would still be able to get enough fuel out of the ocean.

could continue to be used for billions of years

If nuclear fusion is so great, why not use it?

Where is it?

But there's a little trap

nuclear fusion is very, very difficult

The problem is that two positively charged nuclei don't want to come together.

Pass each other like this

So in order to fuse, they have to collide with each other vigorously, and if they're fast enough, they can overcome the repulsive force, make contact, and generate energy.

particle velocity is temperature

The temperature required for nuclear fusion is 150 billion degrees

(Laughter) That's why fusion is so hard.

When I was doing my doctoral thesis here at the University of British Columbia, I did a little bit of research into nuclear fusion, and then I got a nice job making laser printers, yes, in the printing industry, making printers.

After working there for 10 years, I got a little bored. When I turned 40, I was worried about my life. what should i do

what should i do? What can you do?

Looking back at my past accomplishments, what I've done here around Columbia University is hurting trees in the forest.

I realized that it was like sending a lot of junk mail to everyone.

I wasn't satisfied with that

People who are not satisfied buy Porsche

i find a lover

But I decided to solve the problem of global warming with nuclear fusion.

So the first thing we did was look at the literature and look at how fusion works.

Physicists have been studying nuclear fusion, and one attempt is called a tokamak fusion reactor.

It's a large, circular, coiled magnet. It's an electromagnet based on the principle of superconductivity. A ring like this creates a magnetic field that confines a hot gas, called a plasma, in the middle.

Plasma particles keep spinning around the ring.

It creates super-hot heat, allowing nuclear fusion to occur.

So this is what's happening inside the donut, and what you see on the right is fusion plasma.

Another way to create fusion is laser fusion.

Place a little ping-pong ball-like fuel in the center, and fire a laser at it.

The laser is so powerful it can crush a ping-pong ball in seconds.

If you squash it hard enough, it heats up, and if you do it really quickly, in billionths of a second, you can generate enough energy and heat to cause nuclear fusion.

This is what is happening in this device

You can see the laser and the pellet in the middle.

Most people think nuclear fusion won't work.

A physicist working hard in a lab, but thinking nothing is going to happen.

but that's not right

Here's a graph of what we've done over the last 30 years. As you can see, we're 10,000 times more fusion than when we started.

that's a lot of progress

In fact, it's progressing as well as the famous Moore's Law of semiconductor integration on a chip.

This point is called JET, short for European Taurus Joint Research Facility.

In a large European tokamak, this device produced 16 megawatts of energy from 17 megawatts of energy in 1997.

That's not going to work. But considering that we've achieved 10,000 times what we started with, we're pretty close considering we've achieved 10,000 times.

This second point is the NIF

It's at the National Ignition Facility.

It's a large laser fusion reactor in the United States, and last month it made a big fuss about an announcement that it was able to produce more energy through nuclear fusion than was put into the center of a ping-pong ball.

But it's still not enough, because the laser consumed more energy than that.

Now it's ITER in French pronounced

It's a giant donut magnet that's being built by a multi-national effort in the south of France, and when it's finished, it will generate 500 megawatts of fusion energy from just 50 megawatts.

this is real

it works

Devices like this generate energy.

If you look at the graph, you'll notice that these two points are slightly off to the right.

I'm getting this delay

Even when building these devices, the progress of science was on this growth curve.

But here's where politics comes in. We lacked the will to pursue research, which is why we ended up on the right side of the curve.

ITER, for example, was supposed to be completed in 2000 or 2005. ITER, for example, was supposed to be completed in 2000 or 2005, but it was a big international joint venture, so it was delayed a little bit for political reasons.

For example, it took about three years to decide on a building site.

Nuclear fusion is often criticized for being too expensive.

As a matter of fact, we spend $1 billion to $2 billion a year doing research We spend $1 billion to $2 billion a year doing research.

But you should compare it to the cost of the Moore's Law process.

its cost is more than fusion

The result of Moore's Law is this cell phone in my pocket.

We've spent about a trillion dollars on this phone and the internet behind it.

Then my father would see it and be proud

About $650 billion is spent each year subsidizing oil and gas and renewable energy.

Only 0.5% of that is used for nuclear fusion.

So personally I don't think it's expensive.

I even think it's underinvested, because we're going to completely solve the energy problem for billions of years ahead.

I may be biased because I founded a fusion development company and I don't have a Facebook account, but I don't have a Facebook account, so I might be biased.

When I started my fusion company in 2002, I didn't think I could compete with the big, rich research institutes.

they had a lot more assets than you

So I decided to find a cheaper and faster solution.

Nuclear fusion with magnets and lasers is pretty cool.

It's a marvelous piece of technology, a marvelous device that has demonstrated that fusion is possible.

But I don't think it's a good fit for a power plant.

It's too big, it's too complicated, it's too expensive, and there's a problem with how the fusion energy is extracted.

In nuclear fusion, fast neutrons are emitted from the plasma.

this hits the wall of the device

damage

You also have to capture the heat of the neutrons, and you have to put steam in a turbine that's set up somewhere, and you've got to have this kind of device in hindsight.

I think there must be a better way

I went back to the literature and read various things.

And here's where my attention was drawn to something called Magnetized Targeted Fusion, also abbreviated as MTF.

In MTF, you fill a large vessel with liquid metal, you fill a large vessel with liquid metal, and you open the middle plug and create a vortex that spins the liquid metal.You open the center plug and create a vortex that spins the liquid metal.

A vortex is generated when the stopper is removed

Now you have a piston that moves outward under pressure, and here you have a piston that moves outward under pressure, compressing the liquid metal around the plasma.

It's kind of halfway between magnetic fusion and laser fusion.

has some great advantages

The liquid metal absorbs all the neutrons and prevents them from hitting the walls of the reactor, which keeps the equipment from deteriorating.

Liquid metal is heated, so it can be passed through a heat exchanger to produce steam, which can turn a turbine.It can be passed through a heat exchanger to produce steam, which can turn a turbine.

It's a convenient way to do this process This process is very convenient

And because the steam is reused to power the piston and cause fusion, and the steam is reused to power the piston and cause fusion, it's a lot cheaper than lasers and superconducting coils.

So far so good, but the only problem is that it's not working.

(Laughter) There's always a problem.

When you compress it, the cooling rate outpaces the compression of the plasma, and when you try to compress it, the plasma just keeps cooling and nothing happens.

I was very disappointed when I found out about this, because it's a really good idea.

Looked for room for improvement

I thought for a moment, how could I improve it?

I thought about impact force.

How about if we use a large hammer and swing it around and change it so that it hits the nail like this How about changing it so that it hits the nail like this?

The key to an idea is how to make an impact

So steam accelerates the piston. This will take some time, but here bang! It hits the piston, and all the energy is put into the liquid metal all at once, compressing the plasma much faster.

I think this will work

I made a device like this in the warehouse

I've built a small device that can be easily compressed. It produces just a few neutrons. These are the neutrons for my business.

this is what i wanted to make

It will be a large device with a diameter of about 3m It will be a large device with a diameter of about 3m. It compresses, energy is produced, neutrons are produced from the liquid metal, are sent to the steam generator, turn the turbine, part circulates to operate the piston, part circulates to operate the piston.

It would fire once per second and generate 100 megawatts of power.

I also built this injection device, which creates the plasma in the first place.

This creates lukewarm plasma of about 3 million degrees This creates lukewarm plasma of about 3 million degrees

Unfortunately, it doesn't last long. We need to make the plasma last a little bit longer. It's gotten a lot better in the last month.

I made a small ball this size, and I put 14 pistons in it, and this compresses the liquid metal.

But compressing plasma isn't easy.

When you compress it, it tends to twist like this, so you have to time the pistons perfectly. You have to time the pistons perfectly.

Finally, many people think that fusion is a pipe dream, something that will never happen, but the reality is that fusion will never happen.

it's coming right in front of me

A large lab showed that fusion was possible, and then a small company stepped in and said that maybe there was a way to do it, but there was a cheaper way.

General Fusion is one such small company, and in the very near future someone will pull it off, probably General Fusion.

thank you very much

(applause)

It's Germany in 1877 AD, and there was a mathematician named Georg Cantor.

Cantor removed the middle third of the straight line and did the same thing with the remaining two lines, recursively.

So each iteration increases the number of base lines from 1 to 2 to 4 to 16.

If you repeat this an infinite number of times--because it's mathematically possible--the result is an infinite number of lines, because each line has an infinite number of points.

He realized that he got a set whose number of elements was greater than infinity.

This shocked him so much that he ended up in a mental institution. When he left the hospital, he became convinced that his destiny was to establish the theory of transfinite sets. For him, the greatest infinite set was God himself.

he is very religious

I made this my mission in life.

Other mathematicians have done similar work

von Koch of Sweden thought of adding lines instead of removing them.

And made this beautiful curve

You don't have to base it on this shape, you can base it on any shape.

So if you change it a little bit, this one pulls down, and if you repeat the operation with this base shape, the result is a very different structure.

They are all self-similar, every part resembles the whole

The same pattern exists at various scales

What puzzled mathematicians at the time was that the shorter the ruler they used, the longer the length they measured.

If you measure a curve created by infinitely repeating operations with an infinitely short ruler, the length will be infinitely long.

It doesn't make sense, so they've relegated this curve to the back of math textbooks.

It's a pathological curve, so I decided I didn't need to explain it.

(Laughter) It's been a hundred years.

And in 1977, French mathematician Benoît Mandelbrot named these shapes fractals and realized that they could be used in computer graphics to represent natural shapes.

You can draw beautiful natural shapes such as human lungs, acacia trees, fern leaves, etc.

Just look at where the base of your thumb and forefinger meet. If you relax your hand, you can see the wrinkles. Wrinkles within wrinkles and wrinkles within wrinkles.

Our bodies are covered with fractals

The mathematician who said this was pathological

I used my fractal lungs to say that.

It's ironic, and here I'm going to show you a recursive operation of nature.

Repeat this process of replacing the straight line here with the overall shape.

2 times, 3 times, 4 times, and so on.

There are many self-similar forms similar to this

using a self-organizing system

In the 1980s, I was looking at aerial photographs of villages in Africa and noticed that they had fractals.

"This is amazing, but I wonder why?"

I wanted to ask people why

I got a Fulbright scholarship to travel to Africa for a year, asking about the reasons for fractal architecture.

(Laughter) When I got to this city, and I had already done a simple fractal modeling of this city, I actually went to the city, and I went to the chieftain's castle, and in my crappy French, I said, "I'm a mathematician -- I want to stand on your roof."

Without a scowl he took me up on the roof where we talked about fractals Without a scowl he took me up on the roof where we talked about fractals

He said, "Yeah, it's a square within a square, we all know that."

To my surprise, I found that the royal coat of arms used a square within a square within a square.

You must behave politely along the way

It's an intentional pattern that maps changes in social relationships to changes in geometry. It's the same fractal, but it's not the same unconscious thing like a termite mound.

This is a village in southern Zambia

Built by Baira, this village had a diameter of about 400 meters.

in the shape of a large ring

The circle where the family lives gets bigger as it goes to the back, and the village chief's circle is in the back of this circle.

Looking at this fractally

Here's a house with an altar in it This is a house with several houses A family circle gathering Where there's supposed to be a shrine there's a human, and this is the whole village, a circle of circles The chief's distant relatives are here, the immediate family is here, and here's this little village.

People shouldn't be able to live in such a small village

The residents are spirits, so there's no problem. They're our ancestors.

Of course, this village inhabited by spirits must also have a smaller miniature village.

As Georg Cantor said, the process of recursion goes on forever.

This is Mokolek in the Mandala Mountains near the border of Nigeria and Cameroon.

I saw a drawing by a French architect, and I thought, what a wonderful fractal.

So, if you repeat the operation, you'll end up with this structure.

Here is its structure

Let's repeat the operation once, twice, three times, four times.

In the simulation, I noticed that the whole village was spiraling like this, and this is a line that replicates, a line that self-replicates and becomes a fractal.

This line happens to coincide with the only square building in the village.

So when I got to the village, I said, "Could you show me to that square building?

I feel like there's something."

"I'll show you around, but you won't be able to enter. It's a sacred place where annual sacrifices are made to maintain the fertility cycle of the fields."

If you think about it, the fertility cycle is similar to the recursive cycle of the geometric algorithms that built this place.

Recursive patterns can be seen even in the tiniest of these villages.

This is the village of Nankani in Mali

You walk into the family's house, and there's a recursive stack of pots in the fireplace.

This is the calabash that Issa showed me, and it's also recursively stacked.

It is said that the smallest calabash contains the soul of a woman.

When she dies, in a special ceremony, this mountain called Zaranga is destroyed and her soul goes to eternity.

Infinity is important here as well.

Three questions arise here

Isn't such a similar pattern common to indigenous architecture?

Of course I assumed that

When I first saw fractals in Africa, I thought, "Isn't every indigenous group that doesn't have a hierarchical society do bottom-up architecture?"

but it was a mistake

I've seen dozens of aerial photographs of Native American and South Pacific architecture, but only African architecture is fractal.

Each society has its own unique geometric design.

Native Americans use circles and 90-degree rotational symmetry.

You can tell by looking at pottery and baskets

This is an aerial view of the Anasazi ruins.

Different sizes have different shapes

The second question is, "Dr. Egrash, are you ignoring the cultural diversity of Africa?"

There are three reasons why

First, as Mudimbe puts it in his wonderful book, "The Invention of Africa," he believes that Africa was created first as a colony and then later by opposition forces.

And two, common design methods don't mean we share the same culture, and certainly not genetically.

And third, fractals are self-similar, so even though they're similar to themselves, they're not similar to other things.

It's just a common technology in Africa.

The final question is that the fractals you see here are not mathematical knowledge.

It may be the result of mere instinctive behavior.

Africans can't be using fractals

It wasn't invented until the 1970s.

There's certainly something instinctive about African fractals

I found this thing in the city of Dakar, and I asked people, "What algorithms and rules do you use to make this?"

The answer is, "I just make it so it looks good. It's obvious." (Laughter) But not everything is like that.

Some of them do have algorithms, and they're very sophisticated.

Recursive geometry can be seen in this Mambetu sculpture

The Ethiopian cross also has a wonderful shape

In Angola, the Chokwe people draw lines in the sand, which the German mathematician Euler called graphs, modern Euler paths.

They teach this recursively by age level. Small children learn this, older children learn the next, and older people learn this.

By iterating the algorithm, we learn the mystical iteration.

Get to the next level of knowledge

And finally, wherever you go in Africa

You see this game called Owari in Ghana, Mancala here, Bao in Kenya, Sogo elsewhere.

When you play, suddenly self-forming patterns emerge.

Ghanaians are aware of this self-forming pattern and use it as a strategy.

So this is conscious knowledge

this is a nice fractal

In the Sahel, we see windbreak fences like this all over the city.

Hedges are orthogonal and linear everywhere in the world.

But here in Africa, we have this kind of non-linear scaling barrier.

I found someone who made this near Bamako, Mali, and I asked them, "Why do you build fractal fences here, and I don't see them anywhere else?"

his answer was very interesting

"If you live in the jungle, make straight lines of straw. It's easier and cheaper.

It takes less time and less straw."

"But the wind and sand can easily pass through

This upper mesh block does a good job of blocking wind and sand.

But it's so packed that it takes a lot of time and a lot of straw."

"But I know from experience that the wind gets stronger as you go up from the ground."

It's like a cost-benefit analysis

If you measure the length of the straw, plot it on a log-log graph, and find the scaling factor, it's about the same as the scaling factor for wind speed versus height in your wind engineering book.

So this practical application of these people's scaling techniques is a perfect fit.

The use of the most complex fractal algorithms is found in symbolic code, not in geometry.

The same fortune-telling system is found throughout Africa

It's found on the West Coast and on the East Coast, and you'll often see symbols that are very well preserved. Each symbol is four bits -- a four-bit binary word. First, draw these lines randomly in the sand and count them.

I'm going to do this so fast that I didn't know what I was doing. You only draw four random lines. How do you generate 12 symbols from that?

I have no clue and they won't tell me even if I ask

"I can't teach you this,"

"I'll pay you. Will you be my teacher? Come every day, I'll pay you."

"It's not about money, it's about religion," he said.

At last, he said, "Listen to Cantor's story in 1877."

and I started telling them why I came to Africa.

One of them said, "Come over here, I might be able to help you."

gave me the ritual to become a vamana monk

All he was interested in was mathematics, so he kept shaking his head and saying, "I never learned this way." He kept shaking his head and said, "I never learned this way."

When you go to bed, put a cola nut on the floor, bury it in the sand, give 7 coins to 7 leprosy patients, and so on.

I was finally able to let you in on the secret.

It was a pseudo-random number generator using deterministic chaos.

Once you have a 4-bit symbol, put another side by side.

An even number plus an odd number is an odd number

Odd number plus even number

An even number plus an even number is an even number An odd number plus an odd number is also an even number

The remainder of addition and division by 2 is the same as a computer parity check.

And I'm going to use this symbol again and repeat, it's a self-generating variety of symbols.

really uses some kind of deterministic chaos

Because it's a binary system, it can be built in hardware, and it would be a very good learning tool for teaching engineering in Africa.

This history is interesting

In the 12th century, Hugo of Santaya brought it from the Islamic religious world to Spain.

So it spread to the world of alchemy as geomancy, prophecy of the earth.

This is a divination chart drawn for King Richard in 1930.

A German mathematician named Leibniz introduced geomancy in his doctoral dissertation, "Combinatorics."

He said, "Instead of using one or two vertical lines, use 0's and 1's so you can count in powers of 2."

yes 0 and 1 binary

George Boolean created Boolean algebra from Leibniz's binary system, and John von Neumann used it to build digital computers.

The foundation of the world's digital circuit, like this little PDA and laptop here, was born in Africa.

Brian Eno says computers lack "Africa", but Brian should learn more about African history.

(Laughter) (Applause) So in conclusion, I'd like to talk about the application of this idea.

Visit our website The applet is free and runs in your browser

Anyone in the world can use it

The National Science Foundation's "Expanding Participation in Computing" initiative has funded research to develop these programmable design tools, so hopefully in three years, anyone can create their own simulations and creations on the Internet.

In the United States, we study African American, Native American, and South American students.

We found that using this software in a math class statistically significantly improved performance compared to a control group that didn't use it.

We can also teach that there are traditions rooted in mathematics, and traditions are not limited to music and dance.

Ghana started a pilot program

First of all, I got a small research grant to see if people would cooperate.

I also do research in the field of design.

I forgot to mention his name, but my colleague in Kenya, Kelly, came up with a great idea: using fractal addresses for fractal villages, because using regular grid addresses for fractal villages doesn't work.

Bernard Tschumi of Columbia University used it to design the Museum of African Art.

David Hughes from Ohio State University has written a book on African architecture, and in it he introduces fractal structures like this one.

Finally, I want to talk about self-organization, which, as I said earlier, is in our brains.

Also used by Google search engine

In fact, the reason Google is so successful is because it exploited the self-organizing nature of the Internet before anyone else.

environmental sustainability

Entrepreneurship's developmental power is also the basis of democratic ethics.

Of course it has something to do with bad things.

Self-organization is why the AIDS virus spreads so fast

If you don't believe that self-organizing capitalism will have devastating effects, you don't realize it.

Now it's important to think about the traditional African method of self-organization that I mentioned earlier.

their algorithm is robust

It's a kinder, more equal way of thinking about self-organization and starting a new business.

If you want to find a better way to do this kind of work, look to Africa's hardy self-organizing algorithms.

thank you

Life-saving scientific advances are sometimes all around us just waiting to be discovered, whether in the long-honored and honed human wisdom or in the adaptations that organisms have made in the natural world that surrounds us.

All of science begins with observation, but the point is to find patterns and features that are often dismissed as myths or coincidences, extract them, and test them with scientific rigor.

I am often surprised by the results

Western Australia has been plagued by sharks for the last three years.Unfortunately and very sadly, we've had five deaths from shark attacks in the last 10 months.

But it's not limited to Western Australia.

Shark damage to humans is on the rise around the world.

So, perhaps not surprisingly, in July of this year, Shark Attack Mitigation Systems (SAMS), in collaboration with the Institute of Oceanography at the University of Western Australia, made an announcement that caught the attention of the media and the ocean community around the world, focusing on the vision of sharks to develop technology that would mitigate and reduce shark damage.

What I'm going to talk about today is the history of the research that led up to its publication, and how not only is science itself useful for invention, but translating it into the language of science is equally useful.

When we started working on this problem, about three years ago, there were two of Western Australia's first fatal shark attacks, and I happened to be dining with Harry Butler at my previous job.

He's known in Australia as a well-known naturalist, but at the time he spent a lot of time in the marine environment.

Harry Butler is a trailblazer following in the footsteps of the late Steve Irwin.

I asked Harry, "What's the solution for shark damage?"

"Put on a black wetsuit with a yellow belt that looks like a bee pattern, and you'll be able to mimic the alertness of many sea creatures."

I didn't give his idea much thought until after three more deaths, but the new casualties made me think about the value of the idea.

I searched the internet for any clues.

It turned out that the Internet was flooded with evidence to support Harry's ideas.

So, in the biological world, many species used horizontal stripes or warning patterns to make themselves less noticeable in the water or to warn of attacks, and pilot fish, which spend most of their lives around sharks, are no exception.

Oceanographer Walter Starck has also worn patterned wetsuits since the 1970s.Anthropologically speaking, the indigenous peoples of the Pacific Rim strip themselves in rituals to ward off the shark god.

What is going on here?

Aren't these widely-obvious facts waiting for us to think and investigate?

Sharks have many sensory organs, which are mainly used during an attack, and only sight is used to distinguish targets, especially within a few meters before attacking.

It makes sense to pay attention to biological facts, wisdom that has evolved over thousands of years of testing.

But isn't human wisdom following the same evolutionary path? Isn't there a core of truth in these ideas that people thought was important, passed down from generation to generation, and shaping human habits today?

I thought I'd try this idea

I wanted to use the scientific method to test the anecdotal evidence, because if the concept is scientifically validated, it could be the solution to the shark attack problem we're facing.

To do that, we needed a shark vision and neuroscience expert, and again, we searched the world and found the Institute of Oceanography at the University of Western Australia.

I reached the door

Professor Nathan Hart and his team had written a research paper showing that predatory sharks see things in black and white or grayscale.

So I called Nathan, and honestly, with some hesitation, asked him about the idea of ​​using these patterns on wetsuits to reduce the risk of shark attacks, and luckily he thought it was a good idea, too.

As a result, a joint research project was started, supported by the Western Australian government.

we did three main things

The first thing we did was to analyze the physical characteristics of the eyes of three predatory sharks: the great white shark, the tiger shark and the reef shark.

analyzed genetically and anatomically

The next step was to use computer models to understand what the human eye could see at different depths, distances, brightnesses and ocean clarity.

From this, we were able to point out two important characteristics: what patterns or shapes would make the wearer appear hidden or less visible in the water, and what patterns or shapes would have the greatest contrast and could disrupt contours so that humans would not be mistaken for shark prey or prey.

The next thing we had to do was translate it into a wetsuit that people could actually wear. And to work on this area, we approached Ray Smith, who is a surfer, an industrial designer, who also designed wetsuits and designed the original Quicksilver logo, to join our team of scientists who are translating science into artistic wetsuits that people can actually wear.

Here is an example of the first painting

I named it "Don't eat me" suit

Now, here's the striped pattern, which is a very striking design, the contours are destroyed, and it's also meant to prevent sharks from mistaking it for their regular diet, which can sometimes be confusing.

Intended for use with a surfboard

It has a dark and opaque panel on the front, which is especially useful near the sea level where backlit shadows can be a problem.

Then there's the concealment suit, or suit designed with the goal of hiding the wearer in water.

Painted in three colors, in any given situation, one or more color panels match the reflectance spectrum of water to hide in whole or in part, and the final panel is designed to break contours in water.

This is the best suit, especially for diving, that is, for diving deep into the water.

we can see solid science here

We need to look striped if we want to stand out, and we need to look like this if we want to be protective.

But the final challenge is how sharks actually behave when presented with these patterns and shapes.

But in nature, getting people to wear wetsuits with predatory sharks is a lot harder than you might think.

(Laughter) To get a statistical sample size that works as scientific evidence, we baited clothes, and baiting clothes clearly changes shark behavior.

you can't send people into the sea

For ethical reasons, we also avoided using puppets to bite sharks in the ocean.

Despite these conditions, we started testing in January of this year, first with tiger sharks and then with great white sharks.

The method we used was to cover a perforated drum filled with bait with a neoprene surface and use two stereo underwater cameras to observe how the shark interacts with the clothing.

And what we're going to use that stereo for is to get all the data about the size of the shark, where it's coming from, how long it's been going, how it behaves, and it's empirical, not subjective.

We had to use the scientific method, so we compared a control device, a black neoprene device that mimics a regular black wetsuit, to what we called the SAMS technology device.

The results were not only very interesting, but encouraging, and today I'm going to show you snapshots from two experiments.

A 4-meter tiger shark attacking a black control device we found about a minute and a half ago.

And then the same tiger shark found the SAMS device, the evasive SAMS device we found eight minutes ago, and it was circling for six minutes looking for something that it could smell but couldn't see. And that was the final approach.

The white shark case is even more obvious than the tiger shark. Here's the control rig: a white shark targeting a black neoprene wetsuit, coming straight from the bottom, jumping up and biting.

This time it's not a SAMS technology device, it's a striped device.

(Applause) Importantly, this test was conducted by a third party, the University of Western Australia.

and the experiment continues

Results will be submitted to a peer-reviewed journal

The important thing is that this concept is guided by science.

As for SAMS, we're a biotechnology company, so we don't make our own wetsuits.

Granting production licenses to other companies

But I think you might be interested in seeing how SAMS's technology could be applied to wetsuits, and finally, for the first time, live, all over the world -- (Laughter), I'm going to show you how life adaptation, science and design, is similar to how we live our lives.

I'd like to introduce you to Sam, the surfer. This is where you are, Sam?

(Applause) And Edoardo.

(Applause) Thank you.

thank you

Thank you, everyone. (Applause) So what have we accomplished?

I think it used science as a tool of invention rather than a blank slate, and it was concerned with biological evidence, it was also heavily weighted with anthropological evidence, it was translated into the language of science, and it was translated into something that was already there for human benefit.

I think that using scientific ideas as a translator for invention is not limited to this particular case, but can be applied to the process of invention more broadly.

Finally, did the Wright brothers discover manned flight? Or did they observe the biotechnological facts about flight and translate and replicate them into human-useable instruments?

We don't know what the future will look like, at least in wetsuits. Two years from now, five years from now, or 50 years from now.

thank you

(applause)

No preamble needed to explain the Earth

One of the reasons is because of this iconic image taken by the astronauts of Apollo 17 as it orbited the moon in 1972.

It reminded an entire generation of humanity that we were on board a fragile and finite spaceship, Earth, and that we had to protect it.

But while this is a beautiful, static image, the real Earth is constantly changing.

It's changing by the day, which is the time scale of human activity.

And the satellite imagery that we see today is not up to date.

Mostly about a year old

And this is an important point: you can't fix what you can't observe.

Ideally, we'd have images of the entire planet every day.

What are the obstacles to making it happen?

What's wrong?

Here's the thing: satellites are huge, they're expensive, they're time consuming.

It weighs 3 tons

6 meters high and 4 meters wide

It took the entire fairing of the rocket to launch.

One rocket per satellite.

It cost about 100 billion yen

These satellites have done an amazing job of helping us understand our planet.

But if we were to observe the Earth more regularly, we would need more satellites, and the current model doesn't allow us to scale up production.

So, my friend and I started Planet Labs, and we decided to build a very compact, but very good microsatellite.

Let me show you what our satellite looks like This is our satellite

This is not a miniature model This is the actual size

It measures 10x10x30 centimeters and weighs 4 kilograms. We packed it with the latest and most advanced electronics and sensor systems. It's very small, but it can take images with 10 times the resolution of a large satellite, and yet weigh 1/1000th of that.

We call this satellite "Dove" - ​​thank you

(Applause) We call this satellite "Dav" because satellites are usually named after birds, usually named after birds of prey: Eagle, Hawk, Sweep, Kill - this is a bummer - Kestrel.

But it has a humanitarian mission, so we named it "Dub."

Not only did we build these satellites,

launched

It's not just one, it's many.

It all started in our garage

We built our first satellite prototype in our garage.

It's pretty normal for a Silicon Valley company like ours, but I believe it's a first for a space company.

And that's not the only technique we've learned from Silicon Valley.

We quickly prototyped the satellite—

We release software “early and often”

Our risk management is unique

take them outside to test

We launch satellites into space, just for testing purposes, and we've learned how to mass produce satellites.

It used modern production techniques to allow mass production - perhaps for the first time ever.

We call this the agile aerospace industry, and this is how we were able to pack a lot of functionality into a small box.

What has united our team for many years is the idea of ​​democratizing access to satellite information.

Founders - Chris, Robbie and I met at the United Nations more than 15 years ago when they were hosting a conference on exactly this question: "How can we use satellites for humanity?"

“How can satellites help people in developing countries and observe climate change?”

These are the things that brought us together

Our team is passionate about humanitarian use of satellites.

We're space geeks, yes, but we don't just look at space, we also care about things on Earth.

I'm going to show you a video of two of our satellites launching from the International Space Station just four weeks ago.

This is not an animation, this is a video taken by an astronaut through a window.

you can see the size of our two satellites

It's like the smallest satellite ever launched from the largest ever satellite.

And finally, the sunlight makes the solar panels twinkle.

It's really cool.

boom! Yay! it's a decisive moment

(Laughter) We didn't just launch these two -- we launched 28.

It's the largest constellation of Earth-imaging satellites in human history, and they're providing a fundamentally new kind of data about our ever-changing planet.

this is just the beginning

We plan to launch more than 100 of these satellites within the next year.

It will be the largest constellation of satellites in human history.

And the satellites orbit the sun in an orbital plane at a certain angle, with the earth spinning beneath them.

All the cameras point downwards at the earth and scan slowly as the earth rotates.

The earth rotates every 24 hours, and every 24 hours we scan every point on the earth.

like a line scanner on earth

It's not like we're just shooting random places on the planet every day, but we're shooting everywhere on the planet every day.

These just launched a few weeks ago, but we've already got the first images from the satellite, and now we're releasing them for the first time.

This is the first picture taken by our satellite.

When I turned it on, I happened to be over the campus of California State University, Davis.

Even more impressive, when you compare this to other recent satellite images from the same location many months ago.

The image on the left is our satellite image, and you can see the building being constructed.

So we can track growth every day in every city in the world.

The same is true for water conditions.

thank you

(Applause) Being able to see what's going on with water around the world on a daily basis will help conserve water resources.

Conserving water resources and conserving food

By following the crops growing on every farm in the world every day,

Can also help improve yield

This is a beautiful image taken just a few hours ago by a satellite hovering over Argentina.

In short, there are hundreds and thousands of applications for this data, some of which I've mentioned, but others of which are deforestation and melting ice caps.

All of them, every single tree on the planet, can be tracked day by day.

If you compare today's images with yesterday's images, you'll be able to see a lot of the news in the world, such as floods, forest fires and earthquakes.

So we made the decision to make the data accessible to everyone as a way to get the most out of this kind of data.

I want you to see

Thank you. (Applause) We want to help NGOs, businesses, scientists and journalists find answers to questions about the planet.

We want developers to run their apps with this data.

In other words, we want to democratize access to information about our planet.

and back to the first question

This is a whole new set of global data.

And we believe that if we all work together, we can take care of this Spaceship Earth.

And I want you to think about this: if you could get an image of the entire planet every day, what would you do with that data?

What kind of problem do you want to solve?

What kind of exploration would you like to do?

explore it with us

thank you

(applause)

The coldest material in the world is not in Antarctica.

It's not on the summit of Everest, it's not buried in a glacier.

This is in the physics lab, and it's a gas cloud that's kept at a temperature just slightly above absolute zero.

That's 1/395 millionth coldness of a refrigerator, 1/100 millionth coldness of liquid nitrogen, and 1/4 millionth coldness of outer space.

Temperatures this low give scientists an opportunity to learn about the inner workings of matter, allowing engineers to build highly sensitive instruments that will allow us to learn more about everything from exact locations on Earth to events in the far reaches of space.

How do you create such extreme temperatures?

Simply put, we slowed down the particles in motion.

When we talk about temperature, we're actually talking about motion.

The atoms that make up solids, liquids, and gases are in constant motion.

When particles are actively moving, we feel the material is hot.

I feel cold when I'm moving slowly

To cool hot objects and gases in everyday life, place them in a cold environment, such as a refrigerator.

Some of the atomic motion of hot matter is transmitted to its surroundings, cooling itself.

But there is a limit to this, even outer space is too warm to create cryogenic temperatures.

Scientists have instead come up with a way to slow the atomic motions directly, with laser light.

Under most circumstances, laser light energy heats things.

But in some very precise way, the momentum of laser light can cause atoms to stall and cool.

This is what happens inside a device called a magneto-optical trap.

Atoms are injected into a vacuum chamber and centered by a magnetic field.

A laser beam hitting the center of the vacuum chamber is tuned to just the right frequency, and atoms moving in the opposite direction to the laser beam absorb photons and slow them down.

This slowing effect comes from the momentum transfer between atoms and photons.

Six rays, arranged orthogonally, reliably catch atoms moving in all directions.

At the center where the rays intersect, the atoms move sluggishly, as if they were trapped in a thick liquid, and the researchers who invented it call this effect "optical molasses." Magneto-optical traps like this can cool atoms to a few millionths of a degree in absolute temperature, which is roughly equivalent to -273 degrees Celsius.

This method was developed in the 1980s, and the scientist who helped develop it won the Nobel Prize in Physics in 1997.

Since then, laser cooling has been improved to reach even lower temperatures.

But what's the point of cooling an atom that much?

First, cryogenic atoms can be very powerful detectors.

Atoms have very little energy, so they are very sensitive to fluctuations in their environment.

So they're part of very accurate atomic clocks, like those used in devices to find underground oil and mineral deposits, and those used in GPS satellites.

Second, cryogenic atoms hold enormous potential for exploring the frontiers of physics.

This very high sensitivity makes it a candidate detector for future gravitational wave detection in space.

They are also useful for studying atomic and subatomic phenomena that require the measurement of tiny fluctuations in atomic energy.

These fluctuations are drowned out at room temperature when atoms are moving at hundreds of meters per second.

Laser cooling can slow the velocities of atoms to a few centimeters per second, which is fast enough to reveal quantum effects in the atoms' motion.

Research made possible by cryogenic atoms includes Bose-Einstein condensation, a phenomenon in which atoms are cooled to near absolute zero, a novel state of matter.

So researchers will need the power of the coldest atoms to continue their attempts to understand the laws of physics and unravel the mysteries of the universe.

A few years ago, I was waiting for my flight at Kennedy International Airport when two women came up to me -- old, petite, pushy women of Italian descent -- and I don't think it would hurt to call them that.

The taller one was about this size, but he approached me a little and started talking to me.

Aren't you the 'eat, pray, love' guy that's been talked about lately?

I answered yes

Then he taps his friend on the shoulder and says, "That's why I told you this kid.

I wrote a book based on that movie."

(Laughter) It's me.

But I'm really glad that I was the person, because "Eat, Pray, Love" was a big turning point.

But at the same time, I found myself in a difficult position to continue as a writer. I didn't know how I could write a book that would make people happy again. People who loved it would be disappointed with what the next one would be, because it wouldn't be 'Eat, Pray, Love'.

There's no chance it'll work out anyway, and if there's no chance, I'm seriously thinking of just moving out of the country and raising a corgi dog.

But if I stopped writing, I would lose the vocation I loved.

It means being able to withstand success - staying creative.

In the end, I got my inspiration from something I didn't expect -

It was something I learned from experience when I was younger, how to stay creative when you fail.

To go back a little bit, all my life I've dreamed of being a writer.

I've been writing all my life as a kid, and when I was a teenager, I would send my terrible work to The New Yorker and dream of being found.

After graduating from college, I continued to write while working as a waitress in a diner, desperately trying to get published, but failing.

For about six years — nothing was published

Every day for those six years, the only thing waiting for me in the mailbox was a rejection letter.

Every time I received a letter, I despaired, wondering if I should stop losing, give up writing, and escape the pain.

But I always thought to myself, "I'm not quitting -- I'm going back to where I belong."

Don't get me wrong, I'm not going back to the farm where my family lives.

For me, "going back" means going back to being a writer, because writing is where I belong, and the pain of writing and failing was outweighed by the love of writing.

this is how i got through

But strangely enough, 20 years later, I was in the midst of the "Eat, Pray, Love" turmoil, and I couldn't even publish a book.

The old me was nothing but failures

I'm having unimaginable success now.

have nothing in common

Why did you suddenly feel like you were back in the old days?

In trying to solve that mystery, I finally began to understand that there's a strange, unimaginable psychological connection between big failures and big successes.

Think about it: you spend most of your life in a banal, idyllic, ever-changing chain of experiences, but when you fail, you're suddenly thrown into a seemingly endless abyss of despair.

On the other hand, if you succeed, you'll be thrown just as far, blinded by fame and recognition and admiration.

It's common knowledge that one of the two is bad and the other is good, but at the subconscious level, the two are completely indistinguishable.

The only thing you can sense is the absolute value of the emotional equation, how far you are from who you really are.

In either case, you run the risk of losing your way in the depths of your heart.

But in both cases, I've found that I can find myself back in the same way: to get back to where I am, as quickly and smoothly as possible. Even if you don't know where you are, there are clues.

It could be building something, it could be a family, it could be an invention, it could be an adventure, it could be faith, it could be service, it could be raising a corgi dog.

Writing has always been my place

After the dizzying success of "Eat, Pray, Love," I knew I needed the same thing I needed when I failed dizzyingly.

It was to start writing again, and that's how I got the sequel to "Eat, Pray, Love" in 2010 that I was afraid of.

what happened to that book?

I failed, but I didn't care

I felt like I could endure anything, because I was freed from the curse and returned to my place of writing because I love to write.

I stayed in place as a writer after that, and in 2013 I had a new book, and it was well received, but that's not the point.

The important thing is that I'm still writing new books, and I'm writing more and more. Many of my books will fail, and maybe a few will succeed.

Everyone has a different place to live, but everyone must have something more important than themselves somewhere in this world.

It's not an indulgence or an illusion, it's something of value.

The trick is to find what you love the most -- something of value, make a place for yourself there, and never move.

If one day you suddenly find yourself locked out of it because of failure or success, you'll fight to take back your place, and that's the only way. If you do it with desperation, dedication, dedication, and deep respect, whatever it is, love will be awakened.

Just keep doing it over and over and over and over again... I can assure you from my years of experience that the problem will be solved.

thank you

(applause)

Imagine every scene in a movie, every sound in your favorite song, every single road through your local city.

Now imagine that you want to communicate using only the digits 1 and 0.

Whether you use the Internet to watch movies, listen to music, or get directions, your devices are doing exactly that, using a notation called binary code.

Computers use binary numbers as a reliable way to store data.

For example, a computer's main memory is made up of transistors that switch between a high voltage and a low voltage, like 5 volts or 0 volts.

The voltage can fluctuate, but since there are only two options, even a value of 1 volt is considered "low voltage."

The computer's processing unit reads these values ​​from the state of the transistors and controls other devices according to software instructions.

The beauty of this system is that although the sequence of binary digits themselves has no pre-determined meaning,

Various data are expressed in binary numbers according to their respective rules.

I'll pick up the numbers

In normal decimal notation, each digit is multiplied by a power of 10, and the exponent of the power is 0 as the rightmost digit.

So 84 in decimal notation means 4x10⁰ + 8x10¹

In binary notation, the principle is the same, but the value of each digit means a power of 2, so

84 is represented like this, while characters are represented in a standard format like UTF-8, where each character is assigned a specific value, which consists of several 8-digit binary digits.

In this case 01010100 corresponds to 'T'

So when you have a string of numbers like this, how do you decide if it's a T or 84?

Of course, you can't tell just by looking at numbers, just like hearing the sound "da" alone doesn't tell you anything.

The context must specify either Russian Spanish English

Similarly, with a number, we can determine from the context whether it is a binary number itself or a character data represented by a binary number.

Binary code is also used for more complex types of data

For example, every single frame in this video is made up of hundreds of thousands of pixels.

In a color image, each pixel is represented by three binary numbers, corresponding to the three primary colors.

Each binary number is a numerical representation of the brightness of each color.

A video driver program then transfers that information to the millions of liquid crystals that make up the screen, producing the various tones you see here.

The audio in this video is also recorded in binary, using a technique called pulse code modulation.

A continuous sound wave is digitized with a "snapshot" of amplitude every few milliseconds.

It's recorded as a series of binary numbers, numbering as many as 44,000 per second.

This is read by audio software on your computer to determine how quickly the speaker coil vibrates, creating sounds at different frequencies.

These pieces of information require a huge number of bits,

A good compression format can reduce the size

For example, if an image contains 30 adjacent pixels that show the color green, the pixels are encoded and recorded as "30 greens" rather than individually, a process called run-length compression.

The compression format itself is also encoded in binary code.

By the way, is binary the final form in computers?

not necessarily

There's been research on ternary computers, which have circuits that can be in three states, and there's also research on quantum computers, where circuits can have multiple states at the same time.

But so far, these computers have not been physically stable for storing or transferring data.

So right now, everything we see, hear, and read through our screens is the result of a very large number of simple choices between true and false.

The first antidepressants were made, of course, from rocket fuel left over from World War II.

Speaking of war, one in five soldiers today suffers from depression or PTSD.

But soldiers aren't the only ones at high risk of getting these diseases.

Firefighters, EMTs, cancer patients, aid workers, refugees—anyone who's been through trauma or a lot of stress in their lives.

Despite the prevalence of these disorders, current treatments only suppress symptoms, if at all.

When Edward Jenner discovered the first vaccine in 1798 -- it was for smallpox -- he didn't just discover a medicine for a disease, he discovered a whole new way of thinking: medicine could prevent disease.

However, for more than 200 years, disease prevention was not thought to be possible with mental illness.

That was until 2014, when a colleague and I stumbled upon the first drug to prevent depression and PTSD.

We discovered the drug in mice and are now investigating whether it works in humans as well.

This prophylactic psychotropic drug is not an antidepressant.

It's a whole new kind of drug

It works by increasing your resistance to stress, so let's call it a "tolerance enhancer."

Think back to the stressful times you've bounced back.

Broken hearts, exams, maybe you missed your flight

Stress tolerance is an active biological process that facilitates post-stress recovery.

Just like when you catch a cold, your immune system fights it off.

If you don't have enough tolerance, you run the risk of developing mental disorders such as depression as a result of exposure to significant stressors.

In fact, stress is almost always the initial trigger for major depression.

Observations in mice show that stress-tolerance enhancers can protect against both purely biological stressors, such as stress hormones, and psychosocial stressors, such as bullying and loneliness.

Here's an example of mice given high levels of stress hormones for three weeks.

You gave it a biological stressor that had no psychological component.

It causes depressive behavior

Giving antidepressants three weeks beforehand doesn't do anything at all.

But a single dose of a tolerance-enhancing drug a week in advance can completely prevent depressive symptoms.

even after three weeks of stress

This is the first time that a drug has been shown to prevent the negative effects of stress.

Depression and PTSD are chronic, often lifelong illnesses that require treatment.

It also increases the risk of substance abuse, homelessness, heart disease, Alzheimer's disease, suicide, and more.

Globally, the social cost of depression alone is over $3 trillion a year.

But if you knew in advance that someone was at high risk of being exposed to extreme stress—

For example, when Red Cross volunteers enter an earthquake-stricken area,

In addition to the typhoid vaccine, resistance enhancers can be administered prior to departure to the field.

Even if a looter points a gun at you or worse, at least you'll be able to avoid depression and PTSD because of it.

You can't escape stress with this drug, but it can help you recover from stress.

that's the breakthrough

By increasing your resilience, you dramatically reduce your chances of depression and PTSD, and avoid losing your job, your home, your family, even your life.

After Jenner's discovery of the smallpox vaccine, many other vaccines sprang up.

But it took more than 150 years for a tuberculosis vaccine to become widely available.

I wonder why?

Partly because society believed that having tuberculosis made people more sensitive, more creative and more compassionate.

tuberculosis is caused by temperament, not by biology

The same thing is still being said about depression.

Just as Jenner's discovery opened the door for all the vaccines that followed, the drug we discovered opens the door to a whole new field of preventive psychopharmacology.

But whether it will be 15 years from now or 150 years from now depends not only on science, but on what we as a society choose to do.

thank you

(applause)

Computers are powerful tools for creative expression, but much of that expression is confined to the screens of laptops and cell phones.

I'd like to talk about the ability of computers to manipulate objects and interact with people, and to bring the power of computers out of the screen into the physical world in which we live.

A few years ago, a high-end fashion store called Barneys New York called me to make a moving sculpture for their shop window.

In the work "Chase"

There are two pairs of shoes, a man's and a woman's, which play out this slow, tense drama: the man follows the woman, and if she gets too close, she backs off again.

There are magnets in the shoes, and the magnets under the table move the shoes.

My friend Andy Cabatota was building a robotic harp for Björk's "Biophilia" tour, and I was tasked with creating the electronics and control software to make the harp move and play music.

This harp has four pendulums, and each pendulum has 11 strings, and as the pendulum swings and rotates, it makes different sounds. And each harp is connected in a network, so that it can play the right note and the right time.

For the Chicago Museum of Science and Industry, we created an interactive chemistry exhibit that used something like a hockey puck to take elements from the periodic table, combine them, and create chemical reactions.

The museum realized that visitors were spending a lot of time on the exhibit, so a researcher from the Australian Center for Science Education decided to find out what it was all about.

And what I've found is that having things that you can move with your hands helps you understand how to use them, and encourages you to learn with others.

This makes sense, and it's only natural that something designed specifically for that purpose would be easier to use as an interface.

Our hands and minds are optimized for thinking and working with tangible objects.

Think about whether it's easier to use a real keyboard or an on-screen keyboard on your smartphone.

But what really struck me through these -- these projects -- was that they had to be built from scratch. You had to go down to the level of electronics, start with the printed circuit board, and start with the mechanics and the software.

Based on the concept of moving objects under computer control, I wondered if I could create something that would allow me to create a variety of interactive works without having to reinvent the wheel each time.

My first attempt at the MIT Media Lab was to put 512 electromagnets, originally by Professor Yutaka Ishii, in a grid and make things move on them.

The problem is that these magnets cost over $10,000.

The individual magnets are small, but when put together, they're very heavy, and there's also the problem of bending the desk.

I wanted to build something that would allow these operations to be done on any desk.

To explore the possibilities of this idea, we built a bunch of little robots, each with an omniwheel.

It has special wheels that allow it to move freely in any direction, and by combining this robot with a projector, we can create a tangible tool for manipulating digital information.

Let's see an example

It's a video editing app, and all the manipulation of the video is done through a tactile object.

If you want to adjust the color, enter the color edit mode and use the three dials to adjust the color.When adjusting the sound, use the two dials that are operated by hand.

The left and right channels are synchronized, but if you want them to be set separately, you can do so by moving both dials at the same time.

The idea here is to create something that combines the speed and efficiency of using these dials with the flexibility and versatility of a software system.

This is a mapping app for disaster response.

You can use this robot as a pawn to represent a policeman, a fire truck, a rescue team, and you can move it around the map -- by moving it around the map -- to give direction to the unit, and the position of the pawn on the map will be synchronized with the actual position of the corresponding unit.

this is a video chat app

It's amazing how much emotion you can express by giving things a little bit of movement.It's amazing how much emotion you can express.

This interface opens up a lot of possibilities between traditional board games and arcade games, because the interaction with objects allows for very different styles of play.

One of the applications that I find particularly interesting is when applied to problems that are difficult for computers or humans to solve alone.

One example is the protein folding problem.

In this interface, you can attach a handle to the protein on the screen that you can grab and use to move the protein around to experiment with different ways of folding it.

If you try to force it in a molecular simulation, you'll get tactile feedback and you can actually feel the handle resisting your movement.

The ability to physically feel what's going on in a molecular simulation allows for a completely different way of engaging with it.

We're just beginning to explore what might be possible if we use software to control the movement of the things around us.

Computers of the future might look like this

no touch screen

nothing high tech in sight

But when it comes time to video chat, play games, or create slides for your next presentation, things on the table come to life.

thank you very much

(applause)

"why?"

This is the "why?" question that my parents always ask me.

"Why did my child have autism?"

As pediatricians, geneticists and researchers, we've been trying to answer this question.

But autism is not a single state picture

It's really a continuum, a disorder that has a spectrum. Take 13-year-old Justin, for example. He can't speak and he touches images on his iPad to communicate his thoughts and concerns.

This same diagnosis of autism was given to Gabriel, but another 13-year-old boy has a completely different set of challenges.

he is very talented in mathematics

He can do 3-by-3 calculations with ease in his mind, but shows significant difficulty in conversation.

he can't make eye contact

He has difficulty initiating conversations, becomes awkward, and "shuts down" when nervous.

But both of these boys have the same diagnosis of autism spectrum disorder.

One of the things that we're concerned about is whether there's actually an autism epidemic.

One in 88 children in recent years has been diagnosed with autism, and the question is, why does the graph look like this?

Has that number increased dramatically over time?

Or is it because we've recently diagnosed and labeled autism, and people with autism have existed before, and they just didn't have the label?

In fact, in the late 1980s, early 1990s, a bill was passed to provide people with autism with support resources and educational materials.

This increased public awareness has allowed more parents, pediatricians and educators to recognize the hallmarks of autism.

As a result, more people are getting diagnosed and getting access to the help they need.

Moreover, the definition itself has changed over time. In fact, the definition of autism has broadened, and this may explain some of the growth we see here.

The next question on everyone's mind is what causes autism? is

A common misconception is that vaccines cause autism.

But let me be clear: vaccines don't cause autism.

(Applause) The original study that suggested it could happen was completely false.

The Lancet magazine that published it retracted it The Lancet magazine that published it retracted it The author's doctor was stripped of his license

(Applause) The Institute of Medicine and the Centers for Disease Control have investigated this over and over again, but there's been no credible evidence that vaccines cause autism.

In addition, a substance called thimerosal, one of the ingredients in vaccines, was thought to cause autism.

As you can see, the substance was actually removed from vaccines in 1992, and it had no effect on the rise in autism.

Again, there is no evidence that this is the answer.

So the question remains: what causes autism?

There is probably no single answer

Just as autism is a spectrum, so is its etiology, a spectrum of causes.

Based on etiological data, we know that one of the causes, or one of the contributing factors, is the older age of the father, that is, the older father at conception.

Yet another vulnerable and critical period in development is during the mother's pregnancy.

Exposure to certain agents during this period of fetal brain development has been shown to increase the risk of autism.

In particular, valproic acid, a drug sometimes taken by mothers with epilepsy, has been shown to increase the risk of autism.

In addition, some infectious agents can also cause autism.

And what I'm going to spend some time looking at is the gene that causes autism.

I focus on this not because genetics is the only cause of autism, but because it's one of the more easily defined causes that leads to a better understanding of the biological mechanisms and how the brain works, so that we can find ways to intervene.

But one of the genetic factors that we still don't understand is the difference between men and women.

Men are four times more likely to have autism than women, and the cause is still unknown.

One way to understand that genes are a factor is to look at something called concordance.

In other words, if one sibling has autism, what is the probability that the other sibling in the same family has autism?

In that case, there are three types of sibs in particular: Identical twins, twins who share 100% of their genetic information and grow up in the same intrauterine environment, while dizygotic twins share 50% of their genetic information.

And when you look at these concordance rates, one of the things that's striking is that for identical twins, the concordance rate is 77 percent.

very noticeable but not 100%

Genes explain most, if not all, of the risk of developing autism, because in fraternal twins the concordance rate is only 31 percent.

On the other hand, there are differences between fraternal twins and siblings, suggesting that there is something about these fraternal twins that isn't shared just by being siblings.

So this is evidence that the cause of autism is genetic.

How is it inherited?

If you compare this to other familiar diseases like cancer, heart disease, diabetes, and so on, genes actually play a much bigger role than most other diseases.

But it doesn't explain which gene it's caused by.

We don't even know if it's a single gene in the child, a single gene in the child, or a combination of several.

In some cases of autism, it's definitely genetic!

So there's a single dominant, definitive gene that causes autism.

But for others, even though it's genetic, the combination of genes, in addition to developmental processes, ultimately determines autism risk.

Without further investigation, we can't know for sure which of these two categories a person falls into.

So the question arises: How do we identify the gene with precision?

What I'm about to tell you isn't just an idea

Some people have autism because of a genetic defect, but it's not the kind that runs in families.

In some people, it's a completely new mutation in the individual, separate from the genetic mutation inherited from his or her mother and father.

And we can use the ideas I mentioned earlier to understand and identify the genes that cause autism in those people.

So, at the Simons Foundation, we worked with 2,600 people with no family history of autism, and their children and parents, to try to figure out what the genes were that caused autism in their cases.

To do that, we had to go through all the genetic information and figure out what the differences were between a mother and a mother and their children.

I'm sorry to explain this, but I'm going to use the outdated analogy of an encyclopedia rather than Wikipedia, just to make it easier to understand that, like when you're looking at this catalogue, we need to navigate through vast amounts of information.

Our genetic code is a set of 46 volumes, and in this work we had to work with each of these 46 volumes, because in some cases of autism, one of these volumes is missing.

But we have to read through this book because we need more details, and in some cases, more subtle genetic alterations occur.

It could be a missing paragraph, or in a more subtle way, it could be a missing letter. Changing or replacing just one letter in three billion can have a huge impact on how the brain functions, and it can affect behavior.

By looking at our families in this way, we were able to establish that about 25 percent of people, about 25 percent of people, have a single dominant gene that causes autism in their families.

On the other hand, we still don't know about 75% of people.

We were very humbled by this fact, because we realized that it wasn't just one gene that was linked to autism.

Currently, it is believed that there are 200 to 400 genes that can cause autism.

This could partially explain why there's such a broad spectrum in the manifestation of effects.

With so many genes, there's another way to cut into this problem.

200 400 of those genes aren't just random, they're actually linked together.

This creates a circuit, and then the circuits are connected to form a network.

This creates circuits, and these circuits connect to form networks, and we're beginning to understand how the brain works.

We've started a bottom-up approach, where we're identifying these genes and proteins and molecules, and how they interact to drive neurons, and how these neurons interact to operate circuits, and how those circuits control behavior.

But our key is early diagnosis.

It's very important to be able to diagnose people who may have autism while we're opening the window that allows us to change and influence that growing brain.

So people like Ami Kling have developed a way to target infants and use biological markers, in this case eye contact and eye tracking, to identify at-risk infants.

This kid, as you can see, makes eye contact very well while the woman sings "From the Shadows of a Quiet Lakeside Forest." This kid is not autistic.

It's clear in this child's case

while this other kid has autism

This kid, as you can see, can't make good eye contact.

Instead of focusing their eyes on interpersonal connections, they look at their mouths and noses, they look away in other directions, but they don't have social connections. Screening infants for possible autism in large groups in this way is a very robust and reliable way to intervene at an early stage where they can have the greatest impact, which is very useful.

How will the intervention take place?

This is probably a combination of various factors

try medication for some

So identifying the genes that contribute to autism is critical to trying to make sure we know what we're targeting and influencing drugs and what to do about autism.

but this is not the only answer

More than just medication, we use educational tactics.

Some people with autism develop their brains a little differently.

people with autism learn differently

They absorb things around them in different ways, and that's why we need to be able to provide education to people with autism in ways that best suit them.

Beyond that, there are a lot of people in this room who have great ideas about new technologies that we can take advantage of, from any device that we can use to train our brains to be more efficient and to compensate for slightly problematic areas, from Google Glass.

For example, let's take Gabriel, who is socially awkward. He wears Google Glass with earplugs and gets a coach to help him, help him with conversations and how to start them, and one day he might ask a girl out on a date.

All of these new technologies offer us a very important opportunity to make an impact on people with autism, but we still have a lot of work to do.

As far as we know, there's still a lot more we don't know, so I'd like to ask you all to help us think about how we can approach this more effectively, how we can pool our wisdom to make a big difference.

How effective is it in thinking about possible solutions?

Will it really make a big difference in the lives of people with autism and their families? Etc

To see our impact, we need people with autism spectrum disorders of all ages, from young to old, and with a wide range of conditions.

So I invite you to join us in this effort to help make the lives of people with autism better and more fulfilling.

thank you

(applause)

The Olympic motto is “Citius Altius

Fortius" "Faster, Higher, Stronger"

Athletes have rapidly realized this motto.

2012 Olympic marathon winner finished in 2 hours and 8 minutes

If I had competed with the winner of the 1904 Olympic marathon, I would have finished by nearly an hour and a half.

We all feel that humans are inexorably evolving, but we haven't evolved into a new species in the last century.

So what's going on?

I'd like to take a look behind the scenes of the ever-improving sports record.

1936 Jesse Owens holds the world record for the 100 meters.

If Jesse Owens had competed in the 100m World Championships last year, he would still be four meters behind Jamaican sprinter Usain Bolt to finish.

Big opening for sprinters

To make things easier for you, I'm going to show you a demonstration, the brainchild of sports scientist Ross Tucker.

Imagine the stadium of last year's 100m World Championships in Athletics, where thousands of fans hold their breath waiting to see Usain Bolt, the fastest man of all time. Flashes go off as the nine fastest men in the world bend over the starting blocks and take a crouching position.

Imagine you have Jesse Owens in that race.

Close your eyes and imagine the race

Bang! A signal gun sounds

American sprinter jumps to the front

Usain Bolt closes the distance

Usain Bolt overtakes, and every time the runners cross the finish line, they beep.

(Beep) This completes the race.

please open your eyes

The first sound was Usain Bolt

Finally Jesse Owens

let's hear it again

(Beep) If you look at it this way, it's not that big of a difference, is it?

Now think about it, Usain Bolt kicked off the starting blocks and ran on a rug that was specially made to allow the runners to run as fast as humanly possible.

Jesse Owens, on the other hand, ran on a coke-paved cinder track whose soft surface absorbed far more energy from his legs.

And Owens used a gardening shovel to dig holes in the starting line instead of starting blocks.

A biomechanical analysis of the speed at which Owens' joints move means that if he were running on the same pavement as Bolt ran, he would have been just one step behind Bolt, instead of 4.27 meters.

Instead of the last beep, Owens would have been the second beep.

let's hear it again

(Beeps) Track paving technology can make that much of a difference.

Consider longer competitions

In 1954, Sir Roger Bannister became the first person to run a mile in under four minutes.

Today, every year college students put out that record.

On rare occasions, even high school students can pull off

By the end of last year, 1,314 male competitors had run the mile in under four minutes, but like Jesse Owens, Sir Roger Bannister ran on the soft cinder pavement, which absorbs far more energy from his legs than today's man-made tracks.

So when I asked the biomechanics experts how much slower they were running on cinder pavement than they were on man-made tracks, the consensus was 1.5 percent.

Expressing that 1.5% difference in terms of the number of runners who ran the man-made track in less than four minutes per mile,

Only 530 so far.

If you look at it from this perspective, after Sir Roger Bannister, only 10 or fewer people a year have managed to break the four-mile-one-mile barrier.

But 530 is still a lot more than one, and that's because today more people are training in more sophisticated ways.

Compared to Sir Bannister, today's college students train like a pro, because Bannister only trained for 45 minutes each time he skipped his obstetrics and gynecology class.

What's more, in 1904, the athlete who ran the Olympic marathon in less than three and a half hours and won was drinking rat poison and brandy while running the course.

That was his performance-enhancing drug.

(Laughter) Obviously, athletes also became more knowledgeable about performance-enhancing drugs, which worked occasionally in certain sports, but advances in technology made a difference in all sports, like faster skis and lighter shoes.

Let's take a look at the 100m freestyle swimming record

The times keep getting better all the time, but suddenly here and there the records are getting better.

The first dramatic record improvement was due to the flip turn introduced in 1956.

Instead of stopping and then turning, the athlete flips in the water, immediately turns in the opposite direction, and swims away.

The second leap was the introduction of poolside drainage channels, which allowed the water to drain away and prevent water currents from hampering the swimmer's movement during competition.

The final leap has been contributed by the introduction of full-body, low-friction resistance swimming suits.

Throughout the history of sports, technology has changed the course of performance.

In 1972, Eddy Merckx set the record for the longest distance on a bicycle, 49.43 kilometers in one hour.

As bikes got better and they kept reducing air resistance, the record kept going up, and in 1996, the record was 56.7 kilometers, eight kilometers better than Eddy Merckx's 1972 record.

But in 2000, the International Cycling Federation mandated that the competition use essentially the same equipment that Eddy Merckx used in 1972.

Let's see today's record

49.70 kilometers, just an estimated 269 meters longer than Eddy Merckx ran 40 years ago.

So the record-breaking was all thanks to new technology.

But technology isn't the only thing pushing players.

Sure, we didn't evolve into a new human in a century, but the gene pool in sports has definitely changed.

In the first half of the 20th century, physical education teachers and coaches held the idea that the average body type was ideal for all athletics, and medium height was considered good for any sport.

This was also reflected in the physical appearance of the players.

In the 1920s, the average high jumper and the average shot put athlete had the exact same physique.

But when sports scientists and coaches realized that highly specialized physiques suited to each sport's niche were preferable to average physiques, and the old ideas began to fade, a kind of artificial selection began to take place, where the best physiques for each sport began to be naturally selected, and athletes' physiques gradually diversified.

Today, the average good shot put athlete isn't the same size as the average good high jumper, he's 6.3 centimeters taller and 59 kilograms heavier.

This differentiation happened across the sports world.

In fact, if you plot the distribution of more than 20 sports on the axis of height and weight, the body shape of athletes in the first half of the 20th century is

There is some variability, but they are clustered around the average body size.

And the idea that average is good is waning, along with the rise of digital technology, first of all, radio, then television, then the Internet, where millions, maybe billions, of people can watch competitive sports.

Economic incentives for elite athletes, prestige and honor skyrocketed, focusing on a handful of top performing athletes.

It spurred the situation in which specialized body types were artificially selected.

Today, if I were to chart body types for the same sport, this is what it would look like.

Athletes have become more diverse

The scientists who invented this chart called it the "body shape big bang" because it looks a lot like a chart that shows how galaxies spread apart from each other in an expanding universe.

In sports where height is favored, such as basketball, taller players have gotten taller.

In 1983, the National Basketball Association (NBA) signed a groundbreaking agreement to partner with the federation, allowing players to earn dividends on ticket sales and sign contracts with television stations.

All of a sudden, the number of people wanting to be NBA players skyrocketed, and teams began looking around the world for players with the physiques they needed to win championship games.

Almost overnight, the number of players in the NBA who are at least 2.1 meters tall doubled to 10 percent.

Today, 1 in 10 NBA players is at least 2.1 meters tall, but in general, 2.1 meter people are very rare, and if you're American and are at least 2.1 meters tall between the ages of 20 and 40, there's a 17 percent chance that you're an NBA player.

(Laughter) In other words, if you put together six 2.1-meter men, one of them is in the NBA.

Height isn't the only thing that makes NBA players unique.

This is Leonardo da Vinci's "Harmony of the Human Body." The ideal physique, the length of your outstretched arms, equals your height.

My arms are the same length as my height

probably most of you

But the average NBA player is different

The average NBA player is just under two meters tall, but his arms are 2.1 meters long.

NBA players aren't just ridiculously tall, they're ridiculously wide.

If da Vinci had painted the NBA version of "Human Harmony," he would have drawn ovals and rectangles instead of circles and squares.

In sports like this where size is required, big players get bigger.

Conversely, in sports where smaller bodies have an advantage, smaller athletes became smaller.

The height of the average elite female gymnast has shrunk from an average of 160 centimeters to 145 centimeters over the last 30 years, due to better power-to-weight ratios and aerial rotations.

The big players got bigger, the smaller ones got smaller, and the players with distinctive body shapes became more idiosyncratic.

The average length of the forearm relative to the entire arm in water polo players is longer due to the more powerful and springy pitch.

Large players are bigger, small players are smaller, and features are more heavily emphasized.

The ideal physique for a swimmer is a long torso and short legs.

Like the long hull of a canoe that can go fast on water

The opposite body type is suitable for running.

long legs and short torso

It's a trend we see in the physiques of today's athletes.

This is Michael Phelps, the greatest swimmer of all time, standing next to 1.6 kilometer world record holder Hisham El Guerrouj.

The height difference between the two is about 18 centimeters, but they wear pants of the same length because they have the right physiques for their respective sports.

Their legs are the same length, despite their height difference of about 18 centimeters.

People with the types of physiques that would enhance their athletic performance were sought after, and previously non-athletic people, such as long-distance runners in Kenya, were entering the sport.

Just as we see Kenyans as great marathon runners

In Kenya, the Karenjin are seen as excellent marathon runners.

The Karenjin are only 12% of Kenya's population, but they are the majority of the world's elite runners.

They generally have a distinctive body shape—very long, very thin legs, and this is because their ancestors lived in very low latitudes in very hot, dry climates, so they evolved to adapt to that, resulting in very long, thin extremity limbs that help keep them cool.

It's the same principle that a radiator has a long coil, increasing surface area relative to volume to allow heat to escape. The legs are like a pendulum, so the thinner and longer the lower leg at the end, the more energy efficient the swing.

To show just how good the Karenjin are, take the example of 17 historical Americans who ran a marathon in less than 2 hours and 10 minutes.

I ran at a pace of 4:58 per mile.

Last October, 32 Kalenjin men did it.

(Laughter) The population of these people's hometowns is about the same as the population of downtown Atlanta.

Advances in technology and the changing gene pool of athletes alone cannot explain all of the performance gains.

Players have a different mindset

Have you ever seen a movie in which a person is electrocuted and thrown across a room?

there is no impact of the explosion

What's happening is that an electrical impulse causes all the muscle fibers to spasm at once, and the person jumps up on their own.

i mean jumping

That's the power hidden in the human body.

Normally we don't use all of this power.

Our brain acts as a controller, preventing us from using all of our physical capabilities to avoid injuring our tendons and ligaments.

The more you learn about how this controller works, the more you learn to control it in small ways. At times, you can even trick your brain into believing that pushing it any further will not put your body in mortal danger.

Endurance and ultra-endurance sports would be a good example.

Ultra-endurance was once thought to be a health hazard, but now we know that it has the perfect qualities: no fur, ample sweat glands to keep you cool while you run, a nipped waist and long legs relative to your body, and a large joint surface area to absorb shock.

It has a springy arch and short toes that are better suited for kicking off the ground rather than gripping tree trunks, and when you run, you move your upper body and shoulders like this while keeping your head looking forward.

Our primate relatives can't do this.

run like this

We have this big gluteal muscle that allows us to run upright.

Have you ever seen a monkey's butt?

I can't run in an upright position because I don't have gluteal muscles.

When athletes realized that we were, in fact, perfectly capable of endurance races, they began to take on challenges that they hadn't thought of before -- endurance runners like Kylian Jornet of Spain.

Killian runs up the Matterhorn

(Laughter) Tie your sweatshirt around your waist

The slope is steep, so I can't even run

Caught on a rope and climbing

This is a vertical climb of more than 2.4 kilometers, which Killian climbed and descended in less than three hours.

you're surprised

For all his talent, Killian didn't have a monstrous body.

Because he's done this, more athletes will follow in his footsteps, just as they did after Sir Bannister ran a mile in less than four minutes.

Evolving Technology Evolving Genes And Evolving Mindsets

Technological innovation in sport—whether it's new track materials or new stroke techniques—and the democratization of sport, the transmission of new bodies, the participation of new people around the world, the imagination in sport, the real understanding of what the human body is capable of, all of these things have made athletes stronger, faster, bolder and better.

thank you

(applause)

39 million people worldwide have lost their sight

Eighty percent of them live in low-income countries like Kenya, the vast majority of whom could have avoided blindness.

Because it's caused by a treatable and preventable disease Because it's caused by a treatable and preventable disease

Knowing this, I took my family and moved to Kenya.

The reason we got the equipment, the money, the vehicles, the training of the team, the reason we set up 100 clinics in the Great Rift Valley, was to find the cause of blindness, find the cause of blindness, and see if there was anything we could do.

The problem facing us was a big one.

When I reached my destination, I set up a high-tech device.

In an environment with limited power supply hours

I had to run the equipment with a gasoline generator.

One day, I thought, there should be an easier way, because the patients who need eye care the most, because the patients who need it the most are the ones who have the least chance of getting it.

In Kenya and sub-Saharan Africa, mobile phone access is easier than drinking water.

So we thought, why not use mobile technology?

We've developed a smartphone system called Peek, and we've developed a smartphone system called Peek, and that's going to be a huge force for local health care providers to treat their eyes anywhere.

We replaced the bulky, expensive, and fragile equipment in hospitals with smartphone apps and hardware that made it possible for anyone, regardless of language or age, to be screened.

Here's a demo of a 3-year-old child whose vision was accurately tested using an app and an index tracker.

We're piloting it now in communities and schools. We're piloting it now in communities and schools. What we've learned here is that communicating data without jargon is very important.

For example, here, using a visual acuity simulation, when vision is tested, medical personnel and teachers informed of a patient's eye health, medical personnel and teachers informed of a patient's eye health can respond and treat in an understanding manner.

Once you find a patient with low vision, the next big challenge is figuring out why, and to do that, you have to look inside the eye.

Expensive equipment is usually needed to examine the retina.

The retina is the only part of the eye that has a lot of information about the health of the body The retina is the only part of the eye that has a lot of information about the health of the body The retina is the only part of the eye that has a lot of information about the health of the body

We've developed a 3D printer that's a very low-cost device that costs less than five dollars to make, and you can attach it to your phone and you'll be able to see the back of the eye, and it's going to be very high quality.

The great thing is that anyone can do it.

In a clinical study of more than 2,500 people, smartphones with add-on clips were no worse than expensive and unaffordable cameras.

When we first moved to Kenya, we had $150,000 of equipment and 15 team members with us, which was all the medical facilities needed at the time.

Now I just need a smartphone with a bike rider Right now I just need a smartphone with a bike rider Right now I just need a smartphone with a bike rider

only costs $500

Power supply problems can be solved by using solar power

Medical personnel carry solar-powered rucksacks to charge and replenish their phones.

So instead of going to the patient and waiting for the patient to come.

We go to the patient's home and do the most comprehensive, sophisticated and accurate test that anyone can operate with minimal training.

We can connect people in remote areas with global experts, connect people in remote areas with global experts, connect people in remote areas with global experts, connect people in remote areas with global experts, send experts to their homes, and then we can diagnose and plan treatment based on the results.

Managers and hospital directors can use computers to look up a lot of information.

In Nakuru, where I live, I can find people with any health condition, and I can find people with any health condition.

These blind people got this from cataracts that could be cured.

Individual red pins are people blinded by a treatable disease, and you can see where they live.

You can send bulk text messages telling them you're going to therapy.

The more important thing that we learned here is that this was not just made for the community, it was built with the community.

The blue pins represent elders and community leaders, elders and community leaders who can help us find housing and arrange care for our patients.

For patients like Mama Wangari, who went blind 10 years ago and had never seen her grandchildren, we can restore her sight for less than 40 dollars.

it should be like this

Blind millions are statistics only Blind millions are statistics only

The reality is that only one person is blind.

They may be solved with one phone They may be solved with one phone

(Applause) Live demos are not a good idea, but let's do a live demo.

(Laughter) And here's the Peek Vision app.

What you're looking at now is Sam's optic nerve, which connects directly to her brain, which means you're looking at her brain.

the entire retina can be seen

You can find eye and body ailments with this, you can find eye and body ailments with this, and that would have been impossible if you hadn't seen it this way. Clip-on devices could be manufactured for a few dollars, clip-on devices could be manufactured for a few dollars, and they could cure people of blindness.

But now you can use it like this

thank you

(applause)

We live in a complex environment, complexity and dynamism, patterns that can be seen in satellite images and videos.

You can see the scenery outside the window

It's endlessly complex, but somehow familiar, the pattern repeats, but it's not constant.

That's why it's so hard to understand

Every pattern you see is of a different scale, and you can't just break it down and say, "I'm going to make a little climate model."

You can't say, "Now I know something," using the usual product of reductionism, which is breaking things down into smaller pieces in the lab.

If you don't understand the whole, you don't understand anything.

These patterns span a tremendous order of magnitude -- roughly 14 orders of magnitude -- from the microscopic particles that make up clouds to the global scale -- from 10 minus 6 to 10 8 -- over 14 spatial orders of magnitude.

In terms of time, from milliseconds to thousands of years, again about 14 orders of magnitude.

What does this mean?

If you know how to calculate these things, you can trust the results as they are. So let's break this down into smaller grids.

When you think of weather models, spatially they range from global to kilometers, five orders of magnitude, and temporal scales range from minutes to 10 days, maybe a month.

our interest is more

we are interested in the climate

We want to understand variations over time, from years to thousands of years, and this requires understanding on smaller scales.

We have to somehow approximate the unexplained physics at lower scales.

that is very difficult

Climate models in the 1990s stayed on smaller squares, around three orders of magnitude.

The climate model for the 2010s, which I'm working with right now, is in the four-digit range.

So that we can get to 14 digits, we're increasing the simulation power of our climate models so that we can increase it by almost one digit every decade.

To increase the spatial scale by an order of magnitude, you have to do 10,000 times more calculations.

In revising the model, we're trying to take more factors into account and answer more questions.

So what does a climate model look like?

I'll tell you, this is the old climate model, one punch card is one line of Fortran program.

I no longer use punch cards

still using Fortran

State-of-the-art ideas like C haven't made much of an impact on the climate modeling community.

So how do you deal with that?

Are we going to reduce the complexity that you see to each line of the program?

Process one piece at a time

This is a picture of the sea ice that I took while flying over the Arctic.

You can see all the physics of ice growing, melting and changing shape.

understand the flow of matter

We can observe the rate at which snow turns to ice, and we can code that.

wrap it up in code

These current models consist of about a million lines of code, with tens of thousands of lines added each year.

So you can see that piece and the other pieces.

What's Happening in Clouds?

What happens when clouds form and dissipate and rain falls?

that's an example of another piece

What happens when radiation from the Sun is absorbed or reflected as it passes through the atmosphere?

Even those tiny pieces can be programmed.

An example of another piece is the wind that changes ocean currents.

There's also the role of plants in transporting water from the soil back into the atmosphere.

And then we put all of these elements together into a system.

All these pieces make up the whole

Did you somehow understand

I'm going to show you a great example of what's going on in the climate system. What you see here are all patterns that have emerged from the system, like the Southern Ocean Vortex, the Gulf of Mexico Tropical Cyclone - two more are about to form over the Pacific Ocean - and the flow of atmospheric water.

There is no code for ``Jiggle in the South Seas''

Nor is there a code that says, "Have two tropical storms that revolve around each other."

All of these events are the result of

it's very good and it's great

But I want to know what emerges when we change the system.

When something changes, what kind of change will it bring?

Various factors bring about changes in the system

Hundreds of thousands of years of shaking in the Earth's orbit change the climate.

The 11-year and longer cyclical changes that occur on the Sun also cause climate variability.

When a large volcano erupts, it changes the climate.

Changes in biomass combustion, smoke, aerosol particles, etc. change the climate

The ozone hole changed the climate

When deforestation changes the properties of the land surface, how water evaporates, how it moves within the system, it changes the climate.

Contrails where there were none change the climate, not to mention the greenhouse gases that change the system.

Each of these variations is a measure of our understanding of the system.

You can see what the model's skills are

Now, I said "skill" on purpose. Models are neither good nor bad, they're always wrong.

is always an approximation

What we need to be sure of is whether the presence of the model is more informative than the absence of it.

If so, then you can say you have the skills

This shows the effect of the ozone hole on the pressure near sea level, and there are low pressure systems and high pressure systems around the Southern Ocean and Antarctica.

this is the observed data

Here is the model data

The reason the data are in such good agreement is that we understand the physics that control stratospheric temperature and the winds that are generated around the Southern Ocean.

See more examples

The 1991 eruption of Mount Pinatubo sent huge amounts of aerosols and particles into the stratosphere.

So the global radiation balance is out of balance.

Compared to before the eruption, less energy from the incoming sun cooled the planet, and the red and green lines show the difference between the predicted and actual values.

This model is full of skill, not only for global averages, but also for local patterns with high accuracy.

I can also show you more examples, such as a skill related to the solar cycle that alters the ozone in the stratosphere, a skill related to the change in orbit over a period of 6,000 years.

We can validate that, the model is full of skills.

The model is full of skill about the 20,000-year-old ice sheet.

Models are full of skill for decades of trends in the 20th century.

Models have also successfully recreated the climate change caused by the sudden outflow of water from a lake into the North Atlantic Ocean 8,000 years ago.

matches the data

Different targets and different assessments broaden the scope of the model and lead to more intriguing questions, leading to more complex situations. For example, how does dust blowing from the Sahara Desert, shown in orange, affect tropical cyclones in the Atlantic Ocean?

How do the biomass-burning organic aerosols, represented by the red dots, affect clouds and precipitation patterns?

What about the sulphate contamination in Europe, shown by the white strips? What effect does this have on the temperature of the Earth's surface and the amount of sunlight that reaches it?

you can explore the world

Pollution originating in China

You can study the effects of storms on sea salt particles in the atmosphere

It's also possible to predict the effects of these different events occurring at the same time, which raises more interesting questions.

How do air pollution and climate interact?

Can we change the events that affect air pollution and climate at the same time?

The answer is "can be changed"

This is how things changed throughout the 20th century.

the first one is the model

The calculated result is slightly different from the actual weather.

The second one is observations.

Looking through the 1930's

It's constantly changing, but it's at a noise level.

In the 1970s, we see signs of change.

Predictions and observations are becoming more similar.In the 2000s, patterns of global warming can be seen in both observations and models.

we know what happened in the 20th century

That's right? The temperature is gradually

it's going up

And when you look at the model to see why that's happened -- you're right, you're right -- it's basically the carbon dioxide that's been released into the atmosphere.

Matches perfectly to date

But there's one reason to look at the model, and it's in this phrase.

"If we had observations of the future, we would naturally trust them more than models, but unfortunately we don't have observations of the future."

Looking at future data makes a difference.

The future is uncertain and uncertain, but we have options.

this is the option now

We can do something to reduce our carbon footprint in the atmosphere.

The result is the figure above.

If we work harder, we can reduce it even further, and then by the end of the century, we won't have much more than we do today.

Or simply leave it to fate and continue the old fashioned attitude.

The difference between these alternatives can't be answered just by looking at the model.

Sherwood Rowland, who won the Nobel Prize in Chemistry for his work on the depletion of the ozone layer, made a famous statement at the Nobel Prize ceremony. He asked, "If you develop a science that makes predictions, but if you just sit back and wait for the predictions to come true, what's the use of that science?"

Models are full of skill, but how you use the information in the model is entirely up to you.

Thank you for your attention

(applause)

you know me

i'm hiding in your circle of friends

My clothes are still impeccable because they were bought in the good old days when they were making money.

If you look at me, you won't realize that my electricity was actually cut off last week for nonpayment and that I'm eligible for welfare.

But look closer and you'll see the sadness in my eyes, the fear hidden in my confident voice.

Lately, I've been buying $1.99 trial size detergents to keep a living.

You wouldn't know there was a detergent of this size

You invite me to a fancy restaurant that we always enjoyed, but this time I order not a twelve-dollar glass of Chardonnay, but water with a squeeze of lemon.

Save money when choosing menus

Calculate in detail in your head in increments of 1 cent

I'm not asking for dessert, fancy coffee, or refills of wine, so please don't split the bill.

I'm tired of dressing up

I'm not poor, I'm not rich My friend told me there's a difference

I canceled cable TV and the gym, and I don't go to nail salons.

I learned that I can do my own hair care

No retirement savings, no savings

I used it up a while ago

I don't have a luxury apartment as an asset, nor a husband to support me.

Months of delays and non-payments left my credit score in tatters.

The demanding calls came in all the time, first reading out the formula, then only politely showing sympathy for my plight and demanding a payment schedule that was completely unenforceable.

A friend of mine wonders in his heart why someone as educated as me has fallen so suddenly economically.

I'm still competent and sharp, but my work is fragmented, and one-off consulting projects may or may not occur.

At 55, I've learned to pretend to be bright, but I don't have many job opportunities anymore.

I don't remember exactly when it went down, but I can't deny that I've fallen into the unreliable world of "the past" and "the past."

I'm not sure where I belong

What's clear is that all of the dozens of online job applications seem to have been sucked into a black hole.

i don't know what will happen to me

I'm still healthy, but my body hurts, or is it my heart that hurts?

Homeless women used to be invisible to me But now my eyes are drawn to identify them Was their story beginning like mine?

I wrote this piece a year ago

It's a story that combines the circumstances of women I know with me.

I wrote it because I'm tired of pretending I'm fine when I'm not.

I'm tired of pretending to be normal

I couldn't find myself in the media reports.

I don't know anyone who has traveled the world or bought a mansion in Costa Rica.

Only a handful of my friends are saving between 15% and 20%, a level that experts say is necessary to maintain a standard of living in retirement.

Many of my friends are in their 50s and 60s, and the reality they're facing is that their income levels are dropping, they're forced to work for the rest of their lives, and they're either unemployed, sick, or divorced, and they're going bankrupt.

We may not have hit rock bottom yet, but many of us are facing a potentially rock bottom situation for the first time in a series of events.

And actually, it's not that hard to hit rock bottom.

Median U.S. households only have enough savings to cover one month's income.

47% of households cannot raise $400 in an emergency

About half the households in the country are

Just a major repair to your car will sink you into despair.

If you just look around you, you won't realize that I'm not the only one in this situation.

There are people in this room who are in a similar predicament, and even if you aren't, your parents, your sisters, your best friends may be.

we get better at pretending to be normal

Shyness keeps us quiet and closed

When I first decided to speak out about my plight, I created a website, but my friend realized that there weren't any pictures of me, just illustrations like this one.

Even when I made it public, I was hiding.

We live in a world where success is defined by income.

Saying you're facing money problems is almost like declaring yourself a loser.

For someone like me, a Harvard Business School graduate, it's a double defeat.

We baby boomers are told that it's all our fault for not being prepared for retirement.

Why would I go out of my way to withdraw my retirement pension and use it to pay for my mother-in-law's retirement home, or my children's school fees, or just to live on?

We're accused of being unplanned, lazy, and wondering how much we've spent on lattes and bottled water.

Humiliating and blaming is a very pleasant temptation

Many of us don't even wait for others to condemn us, and we feel guilty.

No, I'll take my own responsibility. We could all have saved more.

I know I could have saved more, and if you looked through the last 30 years of my life, you'd find more than one financially stupid act.

That can't be changed, and neither can you. But don't confuse individual independent behavior with institutional factors, the institutional factors that have created a $7.7 trillion shortfall in the cost of living for retirees.

For many baby boomer Americans, it's not because they went to Starbucks too much.

For the past 30 years, we've dealt with: Wages falling, not rising; Pensions disappearing; Housing costs, health care costs, education costs skyrocketing.

it wasn't like this in the old days

Retiree income was like a stable three-legged stool: savings, pensions and Social Security.

But the stool became unstable.

Saving First - What to Save

For many families, once the bills are paid, there is nothing left to save.

The leg called pension is also wobbly

We remember a time when many people were able to receive pensions.

Only 13% of the American workforce currently works for a company that provides pensions.

what is the alternative to pension

Defined contribution funding was introduced, and suddenly the responsibility for retirement planning was shifted from employers to us.

I've not only been empowered, but I've also taken risks, and it's become clear to me that there are a lot of people out there who aren't very good at investing voluntarily for 40 years.

Many are not good at managing market risk

the numbers speak

Half of American households have no retirement savings at all.

is zero

I don't even have a dime in any of my retirement accounts.

The median amount in retirement accounts for 55-64 year olds is $104,000

$104,000 sounds better than zero, but that's about $300 a year in interest.

Needless to say, I can't live with this

With savings declining, pensions becoming a thing of the past, and defined contribution pensions falling short of many Americans' expectations, many nearing retirement are turning to Social Security instead of retirement savings.

but it doesn't work

Fundamentally, Social Security and proper retirement funding are two very different things.

totally inadequate

At best, it only makes up about 40% of my pre-retirement income.

Social Security Began—Many Things Have Changed Since 1935

At the time, a 21-year-old man had a 50% chance of living to 65.

So he retired at 60, did some fishing, kissed his grandson, got a gold watch, and died within five years of starting his retirement benefits.

not nowadays

If you're in your late 50s and healthy, it's easy to live another 20 or 25 years.

That's too long a period to sustain a living, especially if you don't have the money.

Now that we've reached this point, what can you do when you're 50, 55, 60 years old?

If you want to avoid this situation, what can 22- and 32-year-olds do?

From my own experience I have learned

no cavalry coming

No big rescue team, no white prince, no big rescue plan.

If we're going to seize the opportunity to not become old and poor in America, we need to help ourselves and each other.

I'm stepping out of the shadows and standing here openly, and I want you to do the same.

I won't say it's not easy

But I decided to tell my story because I thought it would make it a little easier for people to tell their story.

There's no way to make a difference in this country's surreal conversations about the retirement crisis other than to arm yourself with numbers.

While many of us are devastated by what has happened to us and are wandering around, we need to rise from the grassroots and create circles for recovery.

It's an activity where small groups come together to talk about what happened to them, share resources and information, and start thinking about ways forward.

I believe we can use this as a springboard to rediscover our voices and ring the alarm bells, pressuring government agencies and politicians to fully commit to addressing this crisis with the urgency it deserves.

In the meantime -- in the meantime, we have to learn to live on the ground and save a lot of money.

It's not just about living on your income.

many people already do

What is required of us now is to ask ourselves, in a deeper sense, the true meaning of living a life that is not defined by things.

This is called "focusing on what matters"

"Focus on what's important" means figuring out what you really need to feel fulfilled and grounded.

A friend of mine has a really wrecked car, but he's been diligently saving his money until he finally has $15,000 to buy a flute because music is really important to him.

Focused on what's important

I also let go of the desire for magic, the idea that if I endure it, if I live in austerity, I can get back to normal.

One more resume, one more job application on the Internet, one more meetup, and I'm sure I'll get the kind of job I'm used to-

And the idea is that things will definitely return to normal

But the reality is that neither you nor I can return.

The normal we knew is over

In this new place we're in now, we're being asked to do things we don't want to do.

We are asked to do work that is not commensurate with our position, talents and skills.

I had to step off my throne

Last year, a close friend asked me to help him organize some work.

I thought it would be a community organizing job, the kind of job President Obama did in Chicago.

It was a job to organize someone's closet

If you answer "I won't do that"

He said, "Get off your throne. Money has no color."

As part of a forward-thinking team, ushering in a new era of work-life isn't easy.

the first is the hardest

In the beginning, I didn't have a network, a path, a role model.

We have neither policies nor signposts for us to follow.

We're in a tectonic shift, and we need to find a "stopper" job to get out.

The work that needs to be done for the time being is "bridge" work.

Bumper jobs also let us let go of this perception, that our worth depends on our income, our position, our job.

A "stopper" job can look weird or trendy, depending on your personal circumstances when you're in financial trouble.

I have friends who have PhDs, but who work at home improvement stores and drive Ubers and Lyfts, and I have friends who have started ventures with other baby boomers.

Having a "stopper" job doesn't mean you don't want a job based on your past career.It doesn't mean you don't want a meaningful job.

I want to

A "bridge" job is something you do until you find another job.

I've also learned to think about strategy, not failure, in dealing with a lot of things I don't want to do.

Why don't you all consider this kind of approach?

If you need to live with your siblings to make ends meet, call me.

If you need a roommate to pay your mortgage or pay your rent, do it.

If you need welfare, don't complain, just go get it

According to AARP, only one-third of eligible seniors actually use it.

do what it takes to get to the next round

there are millions of people in the same situation

walk out of the shadows

Save money, focus on what matters, think strategy instead of failure, get off your throne, get through the tough times, and find a "stopper" job.

As a nation, we've lived longer and invested billions of dollars in diagnostics, treatment and disease control.

Living Long Isn't Enough

we want to live a good life

We haven't invested as much in the physical infrastructure to ensure that.

Now we need a new way of thinking about what it means to be old in America.

And I need guidance and ideas on how to live, how to live a rich and delicious life on a modest income.

I'm calling out to change agents, social entrepreneurs, artists, seniors and social investors.

For those who created the status quo, and for those who disrupted it.

We need your help. Imagine what services, products, and infrastructure investments will sustain our dignity, our independence, our well-being for decades to come.

My journey has been from fear and shame to humility and understanding.

I'm ready to fight this battle with you shields side by side Fight with me

thank you

(applause)

For those of you who don't know what I'm doing, the characters I play come from different cultural backgrounds.

Before I start talking about "The Future Is Here," let me talk a little bit about the past. My family was all diverse.

Dominican music blares from the stereo

There were Christians and Jews

Relationships were complicated, and there were conflicts that transcended religion.

I was immersed up to my neck in a world with all kinds of people, and then I went to the United Nations School of International Studies, and it was just that kind of world.

I don't usually talk about it that way myself, but they're all people I love. Now, I'm going to introduce my "friends." The characters are "friends." I'll invite them on stage to perform a self-referential performance with the theme, "The future starts here."

I don't know about other people, but for me, just thinking about how to understand the future and predict the outcome scares me, because I don't know what's going to happen.

This time, the characters answer questions that they've never seen before.

I didn't know what questions would be asked, so I said to Chris, "I'm going to grope it."

Which character will appear

The first question was... "Have you ever had a headache because of a microchip implanted in your brain?"

I see

got it

I wonder if you can hear my voice

I'm Lorraine Levine They say I'm going to put a chip in my head But honestly I'm glad I'm just wearing glasses and not Google Glass

No offense, 'cause we all love it, but when I'm my age, even with normal glasses, I see too much information.

Do you understand?

I don't need any more information, I don't want to know

it's enough

you are all wonderful people

It's wonderful to be able to meet such wonderful people again this year.

So the next question, please. (Applause)

"Dating is boring because humans have become asexual?"

Who would you like?

Hello everyone

I'm Nereida

Let me start by saying that dating can never be boring.

But I'm so excited right now I have to remember why I came here Answering your questions is so exciting

And I think TED is an amazing experience, so the words I have to say right now are Isabel Allende.

It may not make sense, but it's very important to me

'Cause I'm Latino and I'm so glad I had a role model like her I gotta chant my name anyway

That's a nice thing When you're feeling anxious — saying something positive makes me feel better

In my case, when I say the word three times, it calms me down.

Allende Allende...but that's okay anyway, I'm super happy to be here this time, but I have to answer your question.

I was nervous all the time and was wondering what to do, what to do, but come to think of it, I couldn't believe I was able to appear at TED last time.

It was really amazing over there Don't tell me what to do

I was doing

But I said it anyway

Standing in front of President Obama's lectern, asking what to do?

It's like a separation of church and state

I can't turn my head anymore

full full

I don't know what's what

I just want to say that dating would be fun if it were me, how would I reproduce, or in some other way, consent-based, asexual reproduction, I don't know.

You know what I mean

then ciao gracias

So next question: (Applause) "What are your top five favorite songs?"

Well, first of all, I'm the only man so far.

I'm Rasheed, it's my first time at TED.

I guess Sarah didn't want me out last time.

I wonder why

I think it's perfect for TED

right?

i'm into hip hop

Even if you're not that into music, you'll know I'm hip hop because that's how a real MC holds the mic.

can you see it?

hold like this

it's a little lesson

When Sara said she was going to put me out, she said, ``Wow,'' TED's awesome, it's a great place, but she asked me to answer random questions.

Do you want me to stand on stage and answer your questions?

No, it's a physical examination in your head.

Different? (Laughter) I don't want to stand there and be interrogated.

I want you to do that only in NY, right?

Anyway, if it's a top 5 song, I have to pick it from my list, right?

If you want to know more, you should talk about the anti-piracy movement But I'm a Creative Commons believer and I think the main thing is that it's sustainable Here's what I want to keep I want to keep this environment

right?

But if you want to know the top 5 songs

tell me

okay? It doesn't matter if it's now or in the future

have fun after this

ok next question

what do you want

“How many 3D printed organs are there?”

(Laughter) I'm not sure how many of my organs have been 3D printed, but it's a challenge for me to think about the future. By the way, in families all over the world, parents always tell their kids to eat well, because I spend all day sweating and cooking in front of a 3D printer.

You can eat rice."

We're no longer the developing South, and there's a total paradigm shift happening around the world, so we can't say, "We have no food, we have children."

It's already the future

No one suffers from hunger anymore

I'm kind of optimistic, and I hope we can continue to 3D print.

Well, have fun everyone, I'm sure you'll have a great party at TED.

thank you

The next question, (Applause), "What's changed?"

“What has changed since women run the world?”

First of all, I'm Bella. First of all, I'm a feminist, and I just realized that I was born in the '90s, and there are so many different types of women out there, and you might not understand what feminism is.

It's the same Gloria Steinem quote on my shirt.My name is Bella Abzag.She's an important feminist in history.

That's not bad, but my mom says, "Why do you wear pants that treat your body like an object?" But I like it.

It's the same as liking your own voice

My mom says, "Why do you talk like that?" But I don't know what to say, because it's my self-expression.I think I have to not only join hands with feminists of different generations, but also with people who hold different points of view.

this is how i feel

Everyone is amazingly attractive

Then next question

(Applause) "We've found a cure for cancer, but what about a cure for thinning hair?" Now, my name is Joseph Mancuso.

Before I begin, I want to thank the TED audience for being a disciplined group.

Well, I can only say one thing about thinning hair.

For me, if it's a woman, because nowadays, it can be anyone, and it doesn't matter, lesbian, gay, bisexual, whatever.

But in my opinion, when it comes to attractiveness, women actually don't care as much about their hair as they think they do.

I heard from a woman

she has a loving husband it's nice

a young and beautiful woman

husband is older

She said she would love him forever, even if his hair was gray, even if it was gone.

If you ask me, this is a matter of love

There is no mistake

I have nothing more to say

that's all

no trouble please

Now next question

"Have you ever eaten meat that wasn't made in a lab?"

Well... first of all, for a Chinese-American like me, this is a very difficult experience.

I don't know how to introduce myself, because I have a Chinese identity, but my children are American-Chinese.

But if I'm going to give you my personal opinion on meat, the most important thing is that no food is perfect, but it's probably not poison either.

Isn't the place in the middle the drop off point?

But I'll look into this some more, and I'll report back in the next year or so.

Second-rate

Next, next (Applause) "Will a de-racist society ever come?"

thank you for inviting me

I'm Gary Weaselhead, funny name.

A member of the Blackfeet Nation

I'm half Lakota, but this is my real name.

A customer who doesn't smile

(Laughter) I just want you to know that if you ask me about race or anything like that, I'm probably not the first person that people think of when they think of indigenous people.

I'm an activist as well as a professional comedian.

(Laughter) I'm pretty popular on college campuses.

If you want to have a Diversity Day, or a week that's not all white, you're right there.

I think race is kind of artificial, but at the same time, we have to face the past until we can fix the wrongs of the past.

I don't care if "the future starts from here"

I think there are a lot of great people at TED that try to solve problems, but if anything I said made you feel uncomfortable, feel free to do so.

(Applause) I think I can answer one more.

“What is the most popular diet these days?”

Who would you like?

So let's have three or four people rush to answer this question.

it's fast

I want to talk about dieting If you don't love yourself, there's no diet that will make your butt the perfect size, so you're wasting your time.

As an African woman, I believe that the only diet we really need is to get rid of the silly notions like, "You can't have a nice butt."

no i was just kidding

There's nothing wrong with a woman's physique

this is what i mean

Ladies, please honor your bodies

Don't run while feeling hungry

You'll only make yourself and others miserable.

Now for the final answer

We were talking about the most popular diet, right?

First of all, this is my first time at TED.

Maybe I'm not the kind of person you'd expect

Dentures don't fit well

But I asked Sarah to put it out this time, and you didn't put it out last time, so I'm going to say, there must be a lot more important than counting calories.As someone who lives on the streets of New York,heard everyone's worthwhile ideas here, and I've come to believe that you're the ones who make the future, good or bad.

I think homeless is the wrong word.

It's true that there may be nowhere to sleep at night, but that's just because there's no home.

I have a place for you too

find it find yourself there

You know, I'm not talking about virtual reality

That's fine, but it's the reality of this world

What are people's lives like now?

How can we all solve this?

Thank you to everyone who is serious about changing the future.

thank you very much bye bye

(Applause) Thank you very much, everyone.

Chris, thank you for trusting me.

(applause)

good morning ladies and gentlemen

My name is Art Benjamin and I'm a "math magician"

I combine my love for math and magic to do what I call "mathematical magic."

But before we start, I have a question for you

Did any of you happen to bring a calculator with you this morning?

Raise your hand if you have a calculator Raise your hand

Did you raise your hand?

please bring it yes anyone else?

I saw one person behind me

It's you, now there are three

How about the one on this side?

OK, the aisle over there, now we have four people with calculators.

Please come up to the stage with your calculator

And to all the volunteers, give a round of applause.

(Applause) Okay, so let's keep these calculators

I haven't used it, so I have to see if it works

Can someone give me a two-digit number to get me started?

2 digit number please

Audience: 22

Arthur Benjamin (AB): 22 And the other two digits are you?

Audience: 47

AB: 22 multiplied by 47, would it be 1,034 or the calculator is not working correctly Ladies and gentlemen, is it 1,034? 1,034?

Female: No

AB: 594, clap to the three of you here

(Applause) Just in case, can we substitute a more normal calculator?

ok then

What I'm going to do now -- it looks like it took a little while to calculate the answer.

It's okay. For faster multiplication on the calculator.

teach shortcuts

There's something called squaring a number, which, as most of you here know, is multiplying a number by the same number.

For example, 5 squared?

Audience: 25

AB: 25 So how do you calculate the square on most calculators -- let me try this -- for example, if you type the number 5, press the 'x' button, then the '=' button, most calculators will give you the square.

The ancient RPN calculator has a button called "x-square" that allows you to do calculations even faster.

What I'm going to do is square four two-digit numbers faster than they can on their calculator, even with a shortcut.

Now I'd like to ask the people in the second row to help us out. Four people here 1, 2, 3, 4 -- say two digits each.

So -- a two-digit number, please.

Audience: 37

AB: 37 squared, OK

Audience: 23

AB: 23 squared, OK

Audience: 59

AB: 59 squared, OK, and finally?

Audience: 93

AB: 93 squared, tell me the answer

Female: 1369 AB: 1369

Female: 529 AB: 529

Male: 3481 AB: 3481

Men: 8649

AB: Thank you very much.

(Applause) Let's go one step further.

Now let's try squaring a 3-digit number

I will not write. I will proceed by responding to what I am told.

Whoever I pointed to, say a three-digit number

People on stage, please verify your answers

please tell me if that is correct

Three digits please, yes?

Audience: 987

AB: 987 squared is 974,169

(laughs) Good? wonderful

Another, another three digits -- (applause) -- another three digits, please?

Audience: 457 457 squared is 205,849

205,849?

good?

OK, another, another three-digit number, yes?

Audience: 321 AB: 321 is 103,041 103,041

good? One more 3 digit number please

Audience: Yes, 722

AB: 722 is 500 -- oh this is hard

Is it 513,284?

Woman: yes

AB: Right? Then one more, one more three-digit number, please.

Audience: 162

162 squared is 26,244

Thank you very much

(Applause) Let's go one step further.

(Laughter) Now let's try to square a four-digit number.

This time everyone is going to do the same problem;

1、2、3、4

Each person says a number between 0 and 9, resulting in a 4-digit number that I square Audience: 9

AB: 9 Spectators: 7 AB: 7

AB: 5 AB: 5

Audience: 8 AB: 8

9,758, this will take a while, please be patient

95,218,564？

Woman: Yes AB: Thank you very much

(Applause) Now, I'm going to try to square a five-digit number -- and I can do that -- but unfortunately you can't do that with a regular calculator.

(Laughter) 8-figure calculator -- I don't like it.

So, I've reached the limits of my calculator -- what? Yours --

Woman: I don't know

AB: Can your calculator do it?

Oh -- can you do it?

Man: Maybe okay AB: We'll talk later

For now, let me wrap up the first part of the show with something a little more tricky.

Take the highest number on the board, 8649

Ladies and gentlemen, can you enter it on the calculator?

Now instead of squaring, multiply the number by any three-digit number of your choice. Don't tell me what number you're multiplying by -- multiply by a random three-digit number.

So the answer should be 6 digits, maybe 7 digits.

how many digits? 6 digits or 7 digits?

7, and you? Female: 7

AB: Seven digits? 7 digits?

and i don't know

Man: Yeah AB: 7 digits I don't know the 7 digit number

can you do it? say no

(smile)

Okay, so let's make the impossible -- at least try the impossible.

What I'm going to ask you to do is say 6 of the 7 digits, any of the 6, in any order you like.

(Laughter) I'd like to try to guess the remaining number, one digit at a time.

Now say any 6 digit number from your 7 digit number

Female: 1, yes, 197042

AB: You have 6 left?

Woman: Yeah AB: Okay, here's one

Please tell me 6 numbers out of 7 digits

Woman: 44875 AB: I think you only heard 5 digits -- wait a minute -- 44875 --

Are there 6 left?

Woman: Yeah AB: Same as her, OK You're a 7 digit number --

Please write the 6 digit number clearly

Male: 079044

AB: Isn't that 3 left?

3 The odds of me guessing these four numbers correctly

Once in 10,000: 10 to the 4th power

ok 6 digit number

Please mix it up this time, please.

Male: 263972

AB: 7 is the only one left?

Please give a round of applause to all four of us here.

Thank you very much

The next number is -- (Laughter) I have one question for you guys while I'm recharging my mind here.

By any chance, do any of you know the day of the week you were born?

Raise your hand if you think you know the day of the week you were born

So let's start with the man over there

OK, first of all, how old were you? I'll start with men because I know their age...

How old are you?

Audience: 1953

AB: 1953, and what month?

Audience: November AB: November? Audience: 23rd

AB: The 23rd -- is Monday, right? Audience: yes

yes ok anyone else? someone else --

You see, the woman's hand is not raised.

OK, how about you, how old are you?

Audience: 1949 AB: 1949, so what month?

Audience: October AB: October? Audience: Five days.

AB: The 5th -- is Wednesday, right?

Yes, next time I'll go to the back, how about you?

Tell me, how old are you? Audience: 1959

AB: 1959, OK -- so what month?

Audience: February

AB: What day in February? Audience: Six days

AB: The 6th -- is Friday, right? Audience: yes

Great, who's behind that lady over there?

tell me how many years

Audience: 1947 AB: 1947, and what month?

Audience: May. AB: May?

Audience: The 7th AB: The 7th -- is Wednesday?

Audience: yes AB: thank you very much

(Applause) Any of you here who would like to know what day of the week you were born?

You can also do it like this

Of course, even if I say the answer without permission, I won't know if it's correct, so I've been preparing.

I brought a calendar book

You can go back in time to 1800, because you never know what might be there.

(Laughter) I wasn't looking at you, I was just there.

Anyway, Chris, if you don't mind, can you help me?

Here's a calendar book -- someone

Anyone want to know what day of the week they were born? you? OK

First, how old were you?

Audience: 1966

AB: 66 -- Open the 1966 page

So what month?

Audience: It's April AB: What day in April?

Audience: It's the 17th AB: The 17th -- is Sunday

Right, Chris?

Chris Anderson (CA): Yes AB: OK let's do this, Chris:

There's something I'd like you to do with that book, open it to a page other than the 1900s, be it the 1800s or the 2000s -- it's going to be more difficult.

Chris, how old are you? CA: 1824

AB: 1824、OK

So what month? CA: June

AB: What day in June? CA: 6 days

AB: The 6th -- is Sunday, right?

CA: yes AB: and it was cloudy

nice, thank you very much

(Applause) Now, I'd like to close by going back to what was said earlier in this talk.

There was a man who had a 10-digit calculator

Where are you, can you stand? 10 digit man?

OK, just stand up for a second so I know where you are

OK, do you have a 10-digit calculator too?

OK, my next challenge is to mentally square a 5-digit number that requires a 10-digit calculator.

But in order to make this more fun for you and for me, I'm going to do this problem by telling you what I'm thinking.

So you can actually see what's going on in my head while doing this level of math.

Well, I have to apologize to my friend, the magician Lennart Green.

As a magician, I know I shouldn't leak tricks, but I don't expect people here to start doing my show next week, so -- I think that's fine too.

So let's use another column, from you

Give me 5 numbers: 1, 2, 3, 4 --

Oh, we've already done it in this row. Let's do it in the row before that.

Starting with you: 1, 2, 3, 4, 5

Say a number -- that's the five-digit number I'm going to square.

Audience: 5 AB: 5 Audience: 7 AB: 7

Audience: 6 AB: 6

Audience: 8 AB: 8

Audience: 3 AB: 3

57,683 when squared

Please let me explain how to overcome this problem.

I will break this problem down into 3 parts

First, add 57,000 squared, plus 683 squared, plus 57,000 x 683 x 2.

If you add these numbers together, hopefully, you'll arrive at the answer.

Now close the lid

thank you

While I explain other things -- -- you know you can use this, right?

While doing these calculations, you may hear other words appear in the calculations other than numbers.

explain what it is

It's a phonebook, a memory aid that I use, turning numbers into letters.

I replace them with words and later convert them back to numbers

It may sound difficult, but it's not --

I just wanted to let you know that I'm not looking at "Rain Man" here.

(Laughter) Of course, my madness has its own way of doing things.

(Laughter) If you'd like to talk to me about ADHD later, talk to me.

By the way, one last request to judges with calculators -- OK, who knows, here at least 50 percent of the time, I'm going to make a mistake.

In that case, don't tell me what's wrong; just say "close" or something like that and I'll give you the answer -- and it can be fun too.

But if I'm right, whatever you do, don't do it alone, okay?

(Laughter) Let everyone know that I got the right answer.

Well then, let's stop talking and let's start

First of all, from the middle problem, 57 × 683

57 x 68 = 3,400 plus 476 is 3876 This is 38,760 plus 171 38,760 plus 171 is 38,931

38,931; multiplied by 77,862

77,862 will be split cookies and split cookies will be 77,822

This looks good, continue Divisive Cookies, OK

Next, 57 squared is 3,249, so take 3 billion 249 and add it to the cookie, 249

Oops, but come round -- 249 -- add that to the cookie, 250 plus 77 is 327 million split, split, ok, last, 683 squared 700 x 666, plus 17 squared is 466,489, activate if needed, activate, take 466, add to split, so hmm -- 328,489

Audience: Yay! AB: ok

(applause)

Thank you very much I hope you enjoyed the math tricks Thank you

(applause)

year 2006

On a phone call from my friend Harold Ford

When I ran for the Tennessee Senate, I was consulted that I really needed the help of the media.

So I called a friend in New York who works for one of the world's leading news organizations.

you too

we arrived in new york

brand new

dressed in the best suits

And at the reception desk I said, "I have an appointment for lunch."

The woman at the reception gave a signal to follow.

Through a hallway, we were ushered into a bleak room, and a woman said to us, "What's wrong with your uniform?"

That's when my friend rushed over

her face was pale

Are you at a loss for words?

I said to her, "Look, the U.S. Senate needs another black senator, right?"

Harold and I -- (Applause) I still laugh at that time. It caught me off-guard -- and I was deeply depressed, but I wasn't surprised.

I wasn't surprised because my mother said 30 years ago.

my mother was ruthlessly realistic

It was the day I went to a friend's birthday party, and I was the only black kid invited.

He looked at my face and asked, "How have you been treated?"

7 year old me didn't understand

Why are you treated differently than other children?

my mother knew

He looked me in the eye and said, "People aren't always nice to you."

Now in the United States, it's said that when people talk about race, they turn their heads.

If you bring up this topic at a dinner party or at work, you're just touching a taboo.

Everyone will fall silent

It was the same when I came here today. My friends and colleagues stopped me when I said I was going to talk about race because it was too risky.

But I had to tell you that I was actually a little uneasy

And I realized that taking a step to solve a problem doesn't have to be hidden, it takes any form of step to be aware.

That's why I talk about race

By sharing my experiences with you all, I hope you feel a little less anxious and feel more confident talking about race.

There are a lot of people in the world today who say, Obama was elected president, racism is over, forever.

But in the investment business where I work, they say, numbers don't lie.

Here, significant racial disparities that cannot be ignored are family wealth, income, employment opportunities, and health insurance.

For example, in the American business world, white men make up 30 percent of the population in the United States, while 70 percent of all company executives are white men.

Only seven CEOs of Fortune 250 companies are of any other race, and of the board seats of thousands of publicly traded companies, only two are black women.

This is reality

Now let's do a thought experiment. Imagine, I'm taking you to a room. It's a big company, like Exxon-Mobil, and black people are sitting in the boardroom. Isn't that strange?

Would it be just as weird if you were ushered in by a Fortune company whose executives were all white men?

That's when I understood how things were going.

(Applause.) Why did you think I was an employee?

Society is standardized.Racism used to be legal in our country.

it was a matter of course

But even as I worked through this problem, I still didn't understand what my mother said, "How did you treat me?"

I don't mean to complain, I don't want to elicit sympathy

My life has been more successful than I expected. People of all races have always been nice to me.

It is also true that I was mistaken for an employee of the kitchen.

Because it's true that we cite statistics about corporate board diversity, and I stand here to talk about racism, because it threatens to deprive all the children of the next generation, regardless of color or where they come from, from every chance they have.

Racism will also hinder business

Researchers call it "color blindness," which describes people who act like they don't care about racial differences.

If you're surrounded by people just like you, it's all by chance.

So for me, color blindness doesn't mean racism, it doesn't mean fairness.

does not have these meanings at all

"Color blindness" is a dangerous term, because it means avoiding problems.

A corporate study group said that instead of avoiding racial issues, really smart companies tackle them head-on.

In fact, embracing diversity has been accepted, and we've embraced all races, including whites.

I'm going to start off by saying that this is a very difficult task, and it's awkward and uncomfortable, but that's the point.

Race bias is wrong. They say black people don't like swimming, but I love swimming.

I love swimming and have a coach

One training day, I swam a 25-meter pool without holding my breath.

Every time I failed, I started over

and failed many times

When I finally swam out and got out of the pool, I was frustrated, tired and uncomfortable, and said, "Why do you do breath-holding exercises?"

The coach looked at me and said, "Melody, this is not a breath-holding exercise.

It's training to feel comfortable with uncomfortable situations, after all, that's what people spend their days doing."

If you can manage your discomfort better, you'll be able to take it easy and live your life better.

Now is the time to relax and talk about race. If we believe that all people, blacks, whites, Asians, Hispanics, men and women, have equal rights and equal employment opportunities in America, then we can have a real conversation about race.

Don't be color blind

Be a Color Brave

Parents, teachers, entrepreneurs, scientists need to be willing to speak up about race, not just because it's honest, straightforward, and courageously, but because it's the right thing to do, and it's a smart choice, because in all of our businesses and our products, in all of our science and research, we'd be better off adding more diversity.

There's John Skipper who deals with racial issues.

he runs ESPN

I'm from North Carolina, a typical southern white man.

When he joined ESPN, the company already had diversity and inclusion in its culture, but he wanted to go above and beyond.

He demanded that each open position be filled with a variety of vacancies.

Executives were frustrated at first, but then they asked, "Should we hire people who aren't white, or should we hire people who have the right skills for the job?"

Skipper's answer was always the same: "Exactly."

By embracing diversity, I truly believe that ESPN is the best broadcaster in the world.

This story is one of the secret ingredients

So let me tell you my own story. At Ariel Investments, we've seen diversity as a competitive advantage, and its effects extend beyond our business.

Scott Page of the University of Michigan

developed the first mathematical calculation of diversity

If you're faced with a really tough problem, you should embrace a diverse range of people, including their ability to think.

He cites the smallpox epidemic as an example.

Smallpox ravaged Europe, and scientists rallied but were at a loss.

The discovery of a cure for smallpox came out of nowhere: a dairy farmer found that the daughters of the milkers did not get smallpox.

This dairyman discovered that the smallpox vaccine could be obtained from cows.

You're probably thinking, "I don't work for a broadcast station, I don't run an investment company, I don't run a dairy farm.

what can i do ”

Face racial issues head-on

It can also play a role in the recruitment process and the admission process.

Please express your opinion positively even when faced with a difficult problem.

People will tell you a lot, but it's not a big deal. Just do something really simple. Look around you at work, at school, at home.

Look around you carefully with purpose

Interact with a diverse group of people, because by interacting with people who look, think, behave, and come from different backgrounds, you'll discover that your assumptions aren't true, and you'll grow as a person.

Deep insight is nurtured by the people they know and by their spouses, and black people know that every man, woman, and child uses body lotion every day.

It's also very important that young people truly understand that these advances are good for them, because our generation will be a role model for the next generation.

My mother, the one I mentioned earlier, was ruthlessly realistic.

was excellent and exemplary

My mother was a single mother who lived in Chicago raising six children on her own.

I was struggling to make ends meet while working hard at a real estate company.

In the midst of all this, there were times when the phone line wouldn't work at home, the electricity wouldn't work, and I was evicted from the house.

Sometimes, when I moved out, I lived in a small, unfinished apartment at my mom's company.

But my mother remained hopeful and didn't let her children give up.

My mother's brutally realistic story. It was when I was four years old, "Mommy is Santa."

My mother taught me many things, but the most important was the words she used to say to me every day, "Melody, you can be anything."

These words brought me out of the darkness, they helped me love school more than anything else, and I dreamed big when I was on the bus to school.

Because of these words, I stand here and ask all of you to face racism head-on, for children of hope.

(Applause) I want kids to see the CEO on TV and say, "I'm going to be like him," or "I'm like him."

And I want you to know that you can do anything, that you can achieve even the most ambitious goals, that you can become an executive or leader of a big company, or anything you dream of.

The land of the free, the home of the brave, that view is pervasive in American society.

When you have a problem, don't be afraid to tackle it head-on.

take a stand and show courage

So now please, take courage

be bold

As a business leader, please don't put the issue on the shelf.

As a nation, please, don't leave your children behind.

Don't turn your back on racism, face it head-on so you can believe that every child's future matters and dreams can come true.

thank you

(Applause) Thank you, thank you very much. (Applause)

Let's see what I've been working on lately

A Victorian-era magician would have called it a "miracle machine," an "automaton," or a "thinking device."

Introducing Eddie

I'm asleep now wake me up

Eddie Eddie

These machine shows were popular in Europe.

The audience gasped at the movement of the machine.

Science fiction that became a reality, pre-electronic robotics, machines that were far more advanced than other Victorian-era technologies, and what would later be known as "robots."

The word robot was coined for the first time in 1921 in a science fiction novel by Czech screenwriter Karel Čapek.

robota

Derived from the word meaning forced labor

But those robots weren't real.

no intelligence

It was an illusion, a combination of mechanical technology and the magician's skill.

but not eddie

eddie is real

i am 176cm tall

weight 140 kg

It has two 7-axis arms and a torque sensor. Equipped with an omnidirectional sonar detection system.

everyone loves robots

Hi I'm Eddie Will you be my friend?

We've been fascinated by -- building human-like machines.

A machine that looks like a human, acts like a human, and thinks like a human.

Perfect robots are indistinguishable from humans, and we fear them.

In the first robot story, the robots revolt against their creators.

This is probably the most common plot in science fiction.

wah hah you are slaves and we robots are masters

The world is ours, and you guys -- like I said, even though we made faces and bodies, we can't read robots' minds, and that's what makes us uneasy.

When someone gives you something, their eyes, their facial expressions, their body language can tell you what they mean.

Not so with robots

but also vice versa

very!

Robots also cannot anticipate human behavior.

Humans are utterly unpredictable and above all irrational.

I have no idea what to do next

That makes it difficult for humans and robots to work together.

trouble is inevitable

Wow it hurts!

Sorry, the only way to convince you that robots are safe is to create the illusion of trust.

Just as the Victorians invented miracle machines, we can be friends with robots and add a false appearance to make them feel safe.

On top of that, let's teach Eddie some magic.

(Marco) Are you ready? (Eddie) Okay Marco

Abracadabra...

Abracadabra?

Yes this is also part of the illusion

let's continue

Magic creates impossible illusions of reality

So is technology

Artificial intelligence pioneer Alan Turing talks about creating the illusion of machines that can think.

If a computer could make people think it was a human, it could be called intelligent.

In other words, can illusions serve a purpose when there is no technical solution?

To create the robot illusion, humans created ethical rules for robots to follow.

Robots must not hurt humans and must not let humans get hurt

Isaac Asimov

we are personifying machines

By having a friendly face and a reassuring voice

i'm eddie

It went live at TED in March of 2014.

Entertaining humans with robots

And most of all, it shows understanding of people.

Marco, you're stepping on my foot!

Sorry, robots understand the frailty of the human body, avoid getting too close, take into account the unpredictability of humans, and anticipate behavior.

When you cast the spell of technology, forget your fears and enable true collaboration.

(music) Thank you

thank you!

(Applause) (Music) This is the end Thank you very much (Marco) You too Eddie (Eddie) Thank you Marco

(applause)

When I was a young officer, I was taught to follow my instincts and have guts.

It was the summer of 2010, and a bunch of classified documents were leaked from the US Department of Defense.

The world was stunned. The U.S. government was shook, and the public was asking question after question, because there was so much information out there, and it could have so many consequences.

The first thing we thought was, why do young soldiers have access to this much information?

How could a relatively young person know such classified information?

In the summer of 2003, I was put on a special mission, and our covert forces were deployed across the Middle East to fight Al-Qaeda.

With a particular focus on Iraq, our mission was to eliminate Al Qaeda in Iraq.

We stayed there for nearly five years, fighting a battle that was unconventional, difficult, bloody and often involving innocent victims.

We did everything we could to prevent an increase in suicide terrorism and violence by al Qaeda and the Foreign Mercenary Corps. We did everything we could to prevent an increase.

We honed our combat skills, developed new equipment, marched by parachutes, helicopters, small boats, cars, and on foot, moving night after night to stop the carnage of terrorist groups.

Some of us bled and died. We killed others to stop the violence of terrorist organizations.

Now, that's what we've been taught, and we've acted according to the spirit of secrecy that was almost in our DNA.

It meant security and information protection.

It was believed that information was the difference between life and death, and that this was what protected people and kept them safe.

It was common sense that I had in carrying out my duties within the organization, especially in the underground missile storage, it was important to prevent information from leaking from within the organization and to give information only to those members who could show the need.

But the question that sometimes crosses my mind is

Who Needs Information? Who Should Get Information To Accomplish Some Important Mission?

It's very difficult to find the answer in a world that is so interconnected with each other.

who should get the information and who should not

I used to interact a lot with intelligence agencies, and when I complained that they weren't sharing enough secret information, they would look at me straight and say, "I don't know that information."

But we knew we had to change.

I think we should change the way we think about information.

We should have broken out of old ideas and shared information.

We should have changed our mindset from who should know to who doesn't know. We should get information to people who don't have it as soon as possible.

It was a cultural shift that changed the secrecy that was in the organization's DNA.

The first thing I did was to stop working in a cubicle in a building, and instead, I took down the walls and started working in a place called the Situational Awareness Room, in the summer of 2007.

We obtained personal information of people recruiting foreign mercenaries to fight in Iraq.

We generally keep such personal information confidential We generally keep such personal information confidential and we only share information with and seek to fulfill our mission with limited agencies.

But when I asked an intelligence officer, "What should we do?"

When I asked, "You found it."

"I don't mind if you declassify it.]

I said, "Can I declassify it?

What if the enemy finds ”

"It would be their own personal information."

(Laughter) So I did. Many people were puzzled by this approach, but as the information spread, they quickly realized that such information is only valuable to those who know how to use it.

What I know is worthless and useless, and may be useful to others.

So we changed the way we think about information: instead of thinking that hiding information is power, we think that sharing information is power.

This is a radical change, not new tactics, new weapons, something new.

The idea is that we're part of a team, where information is the fundamental element that binds teams together and shouldn't be a barrier within us.

I want you all to take a deep breath and then let it out, because sometimes in life, information leaks out that you don't want.

(Laughter) But that's okay. To be honest, I'm more afraid of the bureaucracy that keeps my information in desk drawers and safes than it is of someone leaking my personal information, because in the end, it's better to share information.

thank you very much

(Applause.) I wasn't sure if you'd be here this morning or earlier this week to meet NSA Deputy Director Rick Leggett to challenge Edward Snowden.

Do you think the United States government should allow Edward Snowden?

I think Rick said something very important.

Our people are not informed of all the facts.

I think there are two sides.

Edward Snowden highlighted the importance of the public knowing the facts.

On the other hand, he's also brought out a ton of documents that he himself can't judge the significance of.

thank you very much

(applause)

(Cashmere) My husband bought me an Amazon Echo for my birthday last year.

It was a bit of a shock, actually, because we both work in privacy and security.

(Laughter) The appliance with the microphone was sitting in the middle of the house, listening all the time.

But we're not the only ones

A study by NPR and Edison Research found that one in six American adults owns a smart speaker, which means they have a virtual assistant at home.

it's amazing

The future—or the nightmare—is just around the corner.

In addition, all Internet-enabled home appliances are sold.

smart light bulbs smart locks smart toilets smart toys smart sex toys—

And by "smart," I mean that they can connect to the internet, collect data, and talk to their owners.

But when your appliances can talk to you, who else are they talking to?

That's what I wanted to know, so I turned my one-bedroom apartment in San Francisco into a smart home for real.

Even my bed connected to the internet

As far as I know, it's just measuring your sleep habits.

All I can say is that the worse thing than having a sleepless night is waking up in the morning to your smart bed telling you, "You didn't meet your goals. Your sleep score isn't high enough."

(Laughter) Thank you, Mr. Smartbed.

What if I'm not sick enough yet?

(Laughter) In total, I installed 18 connected appliances in my home.

I also installed this suriya

(Suriya) Hello, I'm Suriya!

(Laughter) I monitored all smart home activity.

I installed a router that can monitor all network activity.

Think of it like a security guard, recording every single network packet that goes in and out of your smart home.

Kashmir: Surya and I are journalists, he's not my husband, we work at Gizmodo.

(Suriya) Thank you for clarifying.

I wanted to know what the appliances Cashmere bought told the manufacturer.

In addition, I was interested in how the digital information coming out of the home was seen by internet service providers.

What can operators see and what can they sell?

(Cashmere) I did an experiment for two months.

For two months, there was never a moment when the appliances went silent, even when I was away for a week.

(suriya) yeah sure

The data tells me when you wake up

I even know when it's time to brush my teeth

I don't mean to divulge your brushing habits, but it was obvious when you were working from home.

(Kashmir) You're telling everyone here, aren't you?

(Suriya) Don't be shy, it's just metadata

When I turned on the TV and how long I watched it, I can't tell

Here's some trivia about the Hill family's daily life. We don't watch much TV, but when we do, we keep going.

Favorites are "Difficult People" and "Party Down"

(Kashmir) I definitely love "Party Down"

It's a really good show and I recommend it.

But "Difficult People" is about her husband, Trevor.

I was surprised to find out that I was watching it all at once.

Actually, this isn't the first time I've been watched by TV.

The manufacturer, VIZIO, paid the government a $2.2 million settlement last year for collecting every second of what we, millions of people, were watching and selling it to information brokers and advertisers.

(Suriya) It's really a surveillance economy.

Most of the home appliances we purchased communicated with the server every day.

What do you think was the most talkative home appliance?

Amazon Echo

It communicated with the server every three minutes, whether it was in use or not.

(Kashmir) It's usually creepy to have your home appliance chattering all the time without you even knowing it.

It's a fact I wouldn't have known if it wasn't for that router.

When you buy a smart home appliance, you should be aware that as soon as the home appliance becomes your property, your information becomes the property of the company.

You might not expect that when you buy a network-enabled device, it will be connected to the Internet.

It's kind of weird to welcome a device like that into your private space, like your home, and have a company monitor your every move.

(Suriya) Absolutely.

Any data, no matter how trivial, can make money in a surveillance economy.

For example, who cares how often you brush your teeth?

Actually, there is a dental insurance company called Beam.

They've been monitoring customers' smart toothbrushes since 2015 in exchange for discounted insurance premiums.

(Kashmere) I'm sure there are people who think like this.

Sacrifice some privacy to make it more convenient or cheaper

But my smart home experience was different.

Far from being convenient, it was really annoying.

I'll admit that the smart vacuum cleaner was awesome, but a lot of the others were frustrating, like running out of outlets and having to download tons of apps on your phone to get it to work.

You have to log in individually, and even your toothbrush has a password—

(Laughter) Smart coffee was the worst of them all.

(Suriya) Was the cloud-enabled coffee maker useless?

(Kashmir) It may be a simple thought, but I thought it must be wonderful

Wake up in the morning and just say "Alexa, make coffee"

but it wasn't

There are brand-specific commands

You have to say something like, "Ask Alexa Behmor to run Quick Start."

It's not a phrase you can remember before you wake up with caffeine.

(Laughter) It's certainly hard to say, because my Amazon Echo right next to my bed doesn't understand.

My husband and I started each day by yelling that phrase.

(Laughter) My husband was sick of it.

He said, "Cashmere please," "Let me push the button on the coffee maker in the kitchen."

Even so, I said, "That's no good."

"That's not the smart way,"

(Laughter) I'm happy to report that we're still married after the experiment, but barely.

(Surya) If you're going to make smart home a reality, I hope it doesn't irritate you like cashmere.

In any case, smart home appliances on the market will be used for targeting and profiling.

You can guess how wealthy you are just by the number of appliances you own.

Facebook established and patented this technology.

(Kashmere) Even now, every time I access the internet, I feel the anxiety of being tracked, even in my living room.

The bedroom is no exception.

There is an adult toy called "We-Vibe"

You wonder how something like that is online-enabled, is it for two people in a long-distance relationship to share their love from a distance?

Hackers took a closer look at this toy and found that it sent a lot of information back to the manufacturer, from when it was used, how long it was used, to vibration settings and temperature conditions.

All information is stored in the database

So I contacted the company and asked, "Why are you collecting this sensitive information?"

And the answer was, "Because it's perfect for market research."

They were data mining information about their customers' orgasms.

shut up to the customer

Even the most privacy-obsessed people will admit that this is overkill.

(Suriya) That's why I only use things that aren't smart.

(Cashmere) That's right

everyone is happy to know you

(Laughter) (Suriya) I would be honored to provide you with the data points.

(Laughter) The appliances I bought ranged from useful to annoying.

What they have in common is that they send information back to the manufacturer.

When it comes to services like e-mail and social media, people used to say, "You're free because you're the product."

In the world of IoT, it seems like even if you pay for something, it's still a commodity.

Who are the real beneficiaries of the smart home?

(Kashmir) We're tech savvy, aren't we?

Most people also know that these types of products send data over the internet.

Some people are okay with constant commercial surveillance, but some people aren't.

We need to get companies to rethink the design of their products with privacy in mind. Not everyone who buys a Wi-Fi-enabled product wants to participate in "market research."

I want to say this, even though we know this as common knowledge, it's easy to forget the fact that your average home appliance is watching you.

It doesn't look like a camera, so you forget you're being watched.

I don't know what you look like

it may look like a dildo

thank you

(applause)

I have a posting section on my website, and every week people send me hypothetical questions, and I answer them using math, science, and cartoons.

For example, someone asked me, "What happens if you hit a ball that's thrown at 90 percent the speed of light?"

I did the math there

Normally, when an object moves through the air, the air flows around it, but in this case the ball is too fast for the air molecules to avoid the object.

As the ball collides violently with the molecules, it pierces through. When it collides with air molecules, nitrogen, carbon and oxygen are ejected from the ball, and the ball disintegrates into particles, creating thermonuclear fusion shock waves in the surrounding air.

As a result, a large amount of x-rays, along with exotic particles and plasma, will spread out in a spherical shape around the mound, leaving the pitcher's mound a little faster than the ball.

At about 30 nanoseconds later, the home is still far away, so the light hasn't arrived yet.

(Laughter) After 70 nanoseconds -- the ball hits the home -- the "original" ball, already a mass of plasma -- the plasma will engulf and collapse the bat, the batter, the home, the catcher, the umpire.

If you were watching this from the top of a hill as far away as possible, what you'd see is this: a blinding light that takes seconds to fade, followed by a shockwave that spreads out of the stadium, tearing down trees and homes. Eventually, a mushroom cloud rises above the collapsed city. (Laughter) Major League Baseball rules are a little vague. If only

I usually answer questions like this, and a lot of people post weird questions.

Another post read, "What's the scientifically fastest and best way to hide?

Is it immediately feasible? ”

A lot of people post — I also have a question: "Can you prove that you can fall in love again after a heartbreak?"

Some people post questions that are clearly homework and try to get me to do them.

One day, about two months ago, I received a question about Google.

"If all the data in the world were stored on punch cards, how much data would Google have?"

Google is so secretive about its business that no one knows how much data it has, or even how many data centers it has, only its employees.

I asked the people involved several times, but they didn't tell me anything.

So I decided to think for myself

there were some clues

Money was the first thing I saw

Google is obligated to disclose its spending, so it can narrow down the number of data centers it can build, because large data centers have a certain cost.

We can also estimate Google's share of the global hard disk market, and it turned out to be a significant share.

At one point, I read a trial calculation, but with Google, a hard disk failure happens once every 1-2 minutes, and the broken drive is replaced.

you need a lot of drives

So if you look at the funding, you can guess the number of data centers.

Electricity is also a clue

How much electricity do they need? They need electricity to run their servers. Google is more energy efficient than others, but they do need a minimum amount of electricity, so that gives you an idea of ​​how many servers they have at most.

Square footage is also a clue.

Accommodate

You can see the number of server racks

Some data centers give you two of these pieces of information.

The first is the amount spent, and then you have to sign a contract with your local government to get electricity, so you know what you're buying, and as a result -- you know how much electricity you're consuming.

The ratio of these numbers allows us to infer data center numbers for which we don't have any information, but even if we only know one of the two numbers, the power consumption will probably be proportional.

In the same way, you can infer a lot of numbers, like the amount of storage, the number of servers -- the number of drives per server, and so on.

It's like it's circling around the number you're aiming for.

this is interesting

The mathematics used here isn't very advanced, it's not much different than solving a Sudoku puzzle.

I ended up doing research for a day or two, reviewing information piece by piece.

But there are some things I didn't investigate.

You can always see job postings posted by Google,

You should be able to deduce the staffing from here

People who've been to the data center will post pictures, which is not allowed, but you'll get an idea of ​​the hardware they're using.

In fact, you could just look up the pizza delivery guy.

They're staffed, because they know all the data center locations.

And so I came to the conclusion: I felt great. Google has about 10 exabytes of data across its business, plus about 5 exabytes on offline tape drives. Google is the number one consumer of tape drives in the world.

So we've got a rough estimate, a staggering amount of data.

Outperforming any other organization in the world

We have a few competitors, and the one that everyone thinks of is the NSA.

But if you use a similar method to look at the NSA's data centers, it's clear that, apart from what they do inside, the scale of their activity is nowhere near that of Google.

Taken together, the conclusions emerge to answer the question: How many punch cards do you need?

A single punch card can hold about 80 characters. A box can hold about 2,000 cards. If you were to stack these boxes in, say, my hometown of New England, the entire area would be filled with cards that were just under five kilometers deep, which is about three times as deep as the glaciers that existed during the Ice Age 20,000 years ago.

It's unrealistic, but it's the best solution I can come up with.

so i put it on my site

I didn't expect an answer from Google, because they were so secretive that I thought they'd put the article up, but the truth would remain a mystery.

But about two weeks later, I got a message from Google saying they had something they wanted to give me.

So I went to pick it up, and when I opened the envelope, there was a punch card inside. (Laughter) It had Google's name on it.

The punch card has a lot of holes in it.

I got the software, scanned it, deciphered it, and it turned out to be a puzzle.

It was a series of ciphers, and when I cracked it with the help of a friend, it had another cipher embedded in it, and when I cracked it, it was an equation, so I solved it, and finally the message from Google was revealed. Their official response to my article was, "No comment."

(Laughter) (Applause) I love these calculations, not that I love math.

I do a lot of math, but I don't like math per se.

What I love about it is that through mathematics, you can take what you know and just manipulate symbols on paper to discover amazing things that you didn't know before.

Many of the questions are silly, but sometimes mathematics gives us the power to answer them.

Sometimes it just doesn't work

This is a question from a reader anonymously, with the subject line "Urgent", and the content of the email is: "If humans had wheels and could fly, how would you tell them apart from airplanes?"

(Laughter) It made me realize that there are some questions that math can't answer.

thank you

(applause)

I'm sure everyone here has -- you've seen a TED Talk online at least once, right?

let me hear this

It's a song I made from a TED Talk

(Music) This song is cooler when it's slow, so I'm going to slow it down.

(Music) (Ken Robinson) Good morning How are you?

In (Mark Applebaum) — (Kate Stone) — mix the sounds

(Applebaum) Like telling a story

(Todd McCover) Like no one's heard yet

(Stone) crossfader

(Julian Treasure) This is a mixer

(Stone) There are two DJ decks

(Chris Anderson) When you turn the dial, the wheel starts spinning

(Dan Elsey) I've always loved music

(Michael Tilson-Thomas) Melody or Rhythm Sense or Posture?

(Daniel Wolpert) I feel everything that's going on in my body.

(Adam Ockelford) I have this wonderful musical computer in my brain.

(Tilson-Thomas) Work with computers and synthesizers is still an evolving language.

and the 21st century

(Robinson) Turn on the radio, let's go to the disco

You know what this guy is doing— he's dancing to the music.

(Mark Ronson) This is my favorite part

(Applebaum) Door stop, that's the point

(McCover) We all love music.

(Tilson-Thomas) national anthem trendy dance ballads and marches

(Kirby Ferguson &amp; JT) Remix is ​​new music from old music

(Ryan Holladay) Blend seamlessly

(Katherine Schultz) Something like that

(Tilson-Thomas) What happens when the music stops?

(Stone) Yay!

(Applause) As you can see, I watched a lot of TED talks.

When I was asked to appear at TED, I didn't know what perspective I was going to talk about at first, and I immediately started watching tons of TED talks.

I was thinking, "I can't even use my ingenuity to power my village."

In fact, I've spent most of my life DJing in clubs, making pop records.

But I'm a masochist, so I kept watching the videos, and as I watched Michael Tilson-Thomas and Todd McCover talk about music with visceral passion, I definitely felt something inside me.

So, on a little card, every time I heard something that resonated with me, I wrote it down, and I hooked it up to the music, or something that might work, and soon the studio looked like this -- like John Nash's "Beautiful Mando."

The good thing about watching a TED talk is, when you see a really good talk, don't you suddenly wish that the speaker was your best friend for just one day?

You all look like great people

Going on bike trips together, sharing ice cream

you will learn a lot

And sometimes, they'll yell at me because I don't know half the technical stuff.

But you know that I'm just a normal IQ person and I didn't even go to college, so you're willing to let me go So you pet me like a dog

(Laughter) No, in the real world, Sir Ken Robinson and I probably wouldn't be best friends.

He lives in Los Angeles and must be pretty busy, but through the tools at my disposal -- the technology, the approach to composition that I have -- I can squeeze each other into this shared experience, like you just saw.

You pick something from the media that you really like, take it and put yourself in that narrative, or even change it.

So basically, that's what I've been trying to do with this kind of music, and that's what music has been for the last 30 years.

that's the point

Thirty years ago, the first digital samplers came along and changed everything overnight.

All of a sudden, artists can sample anything from the past, from snare drums and Funky Meters -- to Ron Carter's bass -- the theme song for the quiz show "The Price Is Right."

Albums like De La Soul's "Three Feet High and Rising" and Beastie Boys' "Paul's Boutique" also took notes from past recorded music to create what could be considered a Sgt.

They sampled not because they were too lazy to make their own songs

I didn't sample it because I wanted to sell the familiar sound of the original.

Sampling really meant picking up obscure sounds, with a few notable exceptions, like Vanilla Ice's "Doo-Doo-Doo-Doo-Doo-Doo," which you all know.

Anyway, people sampled records because they felt something in the music that resonated with them, and when they heard it, they wanted to put themselves in the narrative of the music.

You hear music and you want to be a part of it, and suddenly you have the technology to make it possible, like the Delta blues fascinated the Stones and the Beatles and Clapton, and they couldn't help but capture the sound with the instruments of the era.

In music, we find a melody or a note that we love and develop it further.

please listen to this

(Music "La Di Da Di" by Doug E. Fresh & Slick Rick) This is the fifth most sampled song of all time on "La Di Da Di."

Sampled 547 times so far

This song was written in 1984 by two hip-hop legends, Slick Rick and Doug E. Fresh, with Ray-Ban and Jerry Curl going strong.

I want it to be popular again

Anyway, this was before the sampling era.

This record has no samples. I looked it up online last night, but a few months ago, this "La Di Da Di" is an old English Cockney expression from the late 19th century.

Doug E. Fresh was a human beatbox

Voiced by Slick Rick on the record, Slick Rick's melodious, catchy vocals gave the next generation of pop records a never-ending source of soundbites and samples.

It was 1984

This is me in 1984. Thank you for asking how I was doing.

It looks like a Twitter post in an old photo

I was totally obsessed with the music of Duran Duran, and you can tell by the way I was dressed.

in the middle

The simplest way I knew how to somehow put myself in a song, the simplest way I knew, was to get a nine-year-old friend to join the band and play "Wild Boys" at the school recital.

To cut a long story short, I was booed and kicked off the stage. If, once in your life, you can experience running away from a gymnasium while being jeered at by 2nd and 3rd graders, I definitely recommend it.It's not fun.

I didn't care about such things.

It doesn't matter who likes the song

I just liked that song and wanted to be part of it.

Over the next decade, "La Di Da Di" continued to be sampled on countless records, including mega hits like "Here Comes the Hot Stepper" and "I Wanna Sex You Up."

Snoop Doggy Dogg covered it on his debut album "Doggystyle" and called it "Roddy Doddy."

copyright lawyers were flying around

And fast forward to 1997 -- The Notorious B.I.G., aka Biggie, reinterpreted "La Di Da Di" and put out a No. 1 hit, "Hypnotize."

(Music: "Hypnotize" by Notorious B.I.G.) Biggie's murder a week before it became a No. 1 hit is one of the tragedies of the hip-hop era, but I'm sure he had fond memories of that song as a thirteen-year-old boy living in Brooklyn, exuberant when "La Di Da Di" first came out.

As you can see, his interpretation is completely unique to him.

There's nothing like flipping, reworking, imitation jumbles.

It's "Modern Biggie" (playing on "Modern Millie")

I couldn't help but tell this joke in this room because I thought it would be funny with everyone.

(Laughter) The world of pop and rap seems to have become too obsessed with sampling.

All of a sudden, away from obscure sonic sampling, everyone was rapping '80s mega-hits like Bowie's "Let's Dance" and disco records.

Records like this don't last long

You don't hear these songs anymore, because those songs are just borrowed from an era steeped in atmosphere.

Don't borrow whole nostalgic songs

Listeners get sick

Taking certain elements out of those songs and adding something new and fresh to them is something I learned from a previous job I worked with, the wonderful Amy Winehouse, "Back to Black."

About the sound of this album -- me, Salaam Remi, and other producers -- there's been a lot of talk about how we've achieved a long-lost sound.

Imagine, for example, a singer of the time singing this song with old lyrics.

everything will be boring

Listening to this musical arrangement, it's clear that Amy, I and Salaam all loved gospel, soul and blues and jazz.

Amy added an important element to the song that resonates with us today.

Time has passed, and now it's time for cultural feat Miley Cyrus to reinterpret "La Di Da Di" in a whole new way for her generation.

(Music "La Di Da Di" by Doug E. Fresh & Slick Rick) (Music "We Can't Stop" by Miley Cyrus) Miley Cyrus wasn't even born when "La Di Da Di" was made. will be taken in as their property

With the dawn of the sampling era, there was an endless debate about the legitimacy of music containing samples.

According to the Grammy Awards selection committee, a song that includes music borrowed from other songs will not be selected for Song of the Year.

Rockists are racists for rock music supremacy, but they always put their theories -- Rockist is a real word --

They're always using their theories to disparage rap and modern pop music, but their theories are completely off the mark, because the dam's broken.

because we are in the post-sampling era

We take the music we like, process it and develop it.

That's what it is

And if you can add something really important and original and blend your musical journey with this, then you have the potential to become part of the evolutionary history of the music that we love, to connect with that song by making it new music again.

I'd like to ask you to listen to one more song that I made for tonight, and it's made up of two TED Talks that I've seen that have inspired me the most.

Pianist Derek Paravicini, a blind, autistic piano prodigy, and Emmanuel Jal, a South Sudan child soldier, is a spoken word poet and rapper.

So again I'm annoyingly finding a way to put myself in these musical histories But I can't stop I love music and I want to mess around with it

so i give this to you

Let's listen to the TED music again.

(music) Thank you very much

(applause)

I study ants. I study ants in the desert, in tropical forests, in my kitchen, in the hills around my Silicon Valley.

Recently, I've realized that the "communications" between ants are used differently in different environments, and I also wondered if this could teach us something about other systems, like how our brains work, or the data networks we design, or even cancer.

All of these systems don't have a central control tower.

An ant colony is made up of non-reproductive female worker ants -- the ants you see walking around -- and at least one reproductive female, who just lays eggs.

don't give instructions to anyone

Despite the name "Queen Ant," she doesn't give orders.

So the colony doesn't have a leader, and this kind of non-centralized system is all controlled by very simple interactions.

Smell is used by ants to communicate with each other.

They use their antennae to sense smells and communicate with each other.By touching each other's antennae, ants can check if they are members of the same nest and know what they are doing.

This is a research arena with lots of ants moving around and interacting with each other, connected by tubes to two other arenas.

When ants make contact with each other, they don't exchange any complicated signals or messages, regardless of who they're interacting with.

What matters to ants is how often they meet other ants.

And we aggregate these encounters into a network.

This is the network inside the arena that the interplay of ant encounters creates. This ever-changing network is manifested in the behavior of the entire colony.

Actually, the brain works in a similar way, but the beauty of ants is that they can observe the entire network in real time.

There are 12,000 species of ants that live in all kinds of environments, and each of them uses a variety of "communications" to address different environmental challenges.

First, the environmental challenge faced by any system is the "operating cost" required to maintain the system.

Another environmental challenge is resources, finding and collecting resources.

Because water is scarce in the desert, the cost of operating the system is high, and the seed-eating ants that I observed in the desert must consume water to obtain water.

Ants harvesting outside their nests are exposed to the scorching heat of the sun, which evaporates the water in their bodies.

But the colonies get their water by metabolizing the fat in the seeds.

Under these circumstances, interaction between ants promotes harvesting behavior.

Harvesting ants must interact well with returning ants before they leave the nest. Here's a colony of harvested ants passing through a tunnel to return to the nest, interacting with harvesting ants.

This makes sense, because the more food you have, the less time you have to find it, so the ants that leave will come back sooner, sending out more ants.

This is a system that is normally off and only works under favorable conditions.

Communication between ants drives harvesting activity.

We are also studying the evolution of this system.

first by colony

Notice the subtle differences

Some colonies reduce their harvesting activity when they're dry, so different colonies have different ways of managing the trade-offs -- how much water they consume to find seeds, and how much water they get in return.

We're trying to understand why colonies exist that reduce harvesting activity, using neuroscience models of ants as neurons.

Just as neurons add up external stimuli to decide whether to fire, ants add up the amount of interactions they have with other ants to decide whether to harvest.

So we're looking to see if subtle differences between colonies -- differences in the amount of interaction each ant needs to make toward harvesting -- could lead to a reduction in colony harvesting activity.

This raises similar questions for the brain.

We talk a lot about the brain, but of course, each brain is slightly different, and each of them has different characteristics, different situations, different electrical properties, etc., of neurons, which require greater amounts of stimulation to fire, which may lead to differences in how the brain functions.

In order to understand the evolutionary process, we need to know whether or not we have successfully reproduced.

Here's a map of a harvester ant colony in an area where I've been tracking ant populations for 28 years, which is about the same as the lifespan of the colony.

Each symbol represents a colony, and the size represents the number of offspring. We used genetic information to match parents and offspring to figure out which colonies were established by second-generation queens, and which parent colonies they came from.

And after years of research, we've come to a startling discovery: Colony 154, for example, which I've been researching for many years, is the parent colony of the first generation.

This is the daughter colony, this is the grandchild colony, and these will be the great-grandchild colonies.

What this study found is that offspring and parent colonies have similar judgments about how hot it must be before they can harvest. Since this offspring colony is so far away from its parent colony that it never meets, the offspring colony ants could not have learned this knowledge from their parent colony.

So the next step is to look for the genetic differences that create this similarity.

From there, you can also explore which ants are thriving.

In previous studies, particularly in the last decade, the southwestern United States has been hit by severe droughts, but colonies that stay in their nests on hot days to conserve water, sacrificing maximum yields, have found that colonies produce more offspring.

Until then, I thought colony 154 was a "loser," because it harvested very little, especially on dry days, while other colonies harvested and got plenty of food. But colony 154 left a lot of offspring.

she is a great queen

We've built a rare three-generation colony here.

For the first time, as far as I know, we've tracked the evolution of collective behaviors in natural fauna to find out which behaviors thrive the most.

The Internet uses algorithms to control the flow of data, much like harvester ants control how many individuals they send out to gather food.

Do you know what they call this analogy?

It is "anternet"

(Applause) The originating computer won't send the data until it's signaled that it has enough capacity to carry the data.

In the early days of the Internet, operating costs were very high, and it was extremely important not to lose data, so systems were designed to initiate data transmission by exchanging signals.

The similarities between the algorithms that ants use and systems that have been invented in recent years are interesting, but it's only one of the handful of ant algorithms that we know of. On the other hand, ants have evolved a lot of great things over the course of 130 million years, so there must be useful hints about data networks in the other 12,000 algorithms that we haven't thought of.

But what if operating costs are low?

In the tropics, operating costs are lower because the humidity makes it less of a burden for the ants to work outside the nest.

But in the tropics, where there are more ants and more species, there is a lot of competition.

Resources used by one species may also target other species of ants at the same time.

So in this environment, "interaction" is used for the opposite purpose.

It's an always "on" system that only stops when there's a problem. One species of ant that I've observed is a harvester ant that forms a path through the trunks and branches of trees, making a number of trips back and forth between the nest and the feeding area.

Let me give you an example of ant security.

In the center, an ant blocks the entrance to the nest with its head, a result of encountering another species.

It's an ant that's moving around with its belly bent up.

As soon as the threat leaves, the gates are opened. Even in computer security, depending on the situation, if the operating costs are low, it may be more efficient to temporarily respond to the threat you face, block the connection, and then start the connection again, rather than building a permanent firewall or fortress.

Now, another environmental problem is that every system needs resources. It's about finding and collecting resources.

Ants solve this problem by swarming, which is a hot topic in robotics today, because it's believed that, for example, it's more efficient to use multiple, inexpensive robots that exchange minimal information to explore other planets, or search for a burning building, rather than one sophisticated, expensive robot, which is exactly how ants do it.

Invasive Argentine Ants Form Expandable Search Webs

This ant does a great job of addressing the big challenge of swarm exploration: the trade-off between searching intensively and exploring large areas.

The way ants do this is if there's a lot of ants in a small area, each of them will explore its surroundings exhaustively, because that area is already explored by other ants.

I think that ants assess density from their interactions, and in very dense situations, they encounter their mates more often, so they search more thoroughly.

Each species of ant must have a different algorithm, because every ant has evolved to adapt to different environments. I thought it would be very useful to learn about this, so I decided to have the ants solve a group search problem in an extreme environment, in a microgravity environment aboard the International Space Station.

When I first saw the picture, I thought, "Wow, those ant boxes are vertical!"

The goal of the experiment was to see if the ants would struggle to cling to a wall or floor and interact less, messing up the relationship between ant density and frequency of contact between ants.

data are still being analyzed

I don't know the result

Even on Earth, it's interesting to learn how different species solve problems in different environments, so we're planning to have children around the world try this experiment with different species of ants.

very easy-

You can experiment with cheap materials.

We might even be able to create an algorithmic map of ant colonies around the world.

An invasive species that burrows into a building would have a wonderful algorithm, because it would go all the way into the kitchen to find food and water.

Picnics are a popular gathering place for ants, and this is a collective resource.

If you find a fruit, there's bound to be a fruit nearby too, so ants that specialize in bulk food use exchanges to recruit allies.

So when they meet another ant, or a scent left on the ground, they turn around and head towards the interaction, and that's how the procession of ants comes to the picnic food.

Maybe we can learn something about cancer from this situation.

Of course, to prevent cancer, it's also important to stop the spread and trafficking of toxic substances that promote cancer development in our bodies, but we can't learn this from the ants, because the ants themselves don't pollute their colonies with toxic substances.

But we may learn something about how to treat cancer.

There are many types of cancer

Each cancer starts in a specific place in the body, and some of them spread and metastasize to cells where they can get the resources they need.

So when early metastatic cancer cells scour for the resources they need, when they find a pool of resources, they may interact to recruit allies.

Ants use "interactions" in different ways in different environments, and we can learn from these interactions about other "non-centralized systems."

For over 130 million years, ant colonies have accomplished incredible feats using simple interactions.

we still have a lot to learn from ants

thank you

(applause)

Today is a bank robbery course with a top chef, and since the average bank robbery is only $7,500, it's clear that the average person needs an introduction.

A complete layman knows nothing about how to cook a ledger.

But the ones who know how to do it are the owners of the biggest banks, and the last window dressing cost them 11 trillion dollars.

What number is 11 trillion dollars?

How many zeros are there?

Another 10 million jobs taken

Now, our job is to educate ourselves to understand why terrible economic crises keep happening, and to find ways to prevent them from happening again in the future.

The answer is to stop manipulation fraud spreading like an epidemic.

Manipulative fraud typically works by having a seemingly legitimate CEO use his position to commit embezzlement.

This could be considered a weapon of mass destruction in the economic world.

The strategy is to use accounting as a weapon in finance, because there's a recipe for how accounting manipulation fraud and fraud happens.

We found this recipe, and I'll tell you about the strange story later.

The first recipe is to grow at crazy speeds. The second recipe is to make or buy bad loans and charge them at very high rates or yields.

Whether you or your bank, following these four simple steps is mathematically guaranteed to happen:

First, it produces record profits for the banks, not just high, but record numbers.

Second, modern executive pay makes CEOs extremely rich.

And third, it's downhill from there, with banks suffering catastrophic losses and going bankrupt without a bailout.

This recipe for bank robbery was discovered by us during the autopsy process of a failed bank.

During the savings and loan crisis of 1984, when I looked at each bankruptcy and tried to find common traits, I found a common deception in all of them.

I'd say that's what the coroner can find out, because that's the recipe for the lethality of banks and the economy.

And we've come to know the exact recipe for stopping this crisis. The crisis cost the household sector alone $11 trillion. The crisis cost the household sector alone $11 trillion. Ten million people lost their jobs.

So let's take a look at this economic crisis and the two epidemics of credit structuring that have been in crisis: valuation fraud and unscreened loans.

If we had the advantage of early warning, we could have dealt with it easily, because in the light of the savings and loan crisis, we knew how to deal with it and how to prevent it.

Furthermore the warning was obvious

It was clear that the plague of accounting manipulation fraud was piling up It was clear that the plague of accounting manipulation fraud was piling up

First, let's look at rating fraud.

It's simply inflating the value of the home you're using as collateral as a guarantee when you take out a loan.

In 2000, the year before Enron's bankruptcy, honest appraisers jointly filed a formal petition calling on the federal government and industry to take action to stop the plague of valuation fraud.

The appraisers explained what was going on, and the bank demanded that the appraisers inflate their valuations, and if they refused, they blacklisted the honest appraisers, and blacklisted the honest appraisers, denying them access.

As we saw in the savings and loan crisis, as we saw in the savings and loan crisis, this kind of fraud can only be attributed to the lender, and honest lenders don't inflate valuations, because they're the best defense against loss.

Yes, the warning was already issued in the year 2000.

This has happened before, but it's been pretty clear.

This was the story of an accounting manipulation scam spread by banks.

So what is an unexamined loan?

Warnings for this were issued earlier

The savings and loan crisis basically took place from the early 1980s to 1993, which was also in the midst of fighting a wave of accounting manipulation fraud, and we witnessed a second wave of fraud in 1990.

Something similar to the sophisticated financial fraud that was happening across the United States started happening in Orange County, California.

We happened to be the overseers of the area.

Investigators reported that they were making loans without even checking the debtor's income.

This is outrageous and would result in huge losses, and it doesn't make sense unless the business entity is involved in an accounting manipulation fraud.

I believe this reasoning to be true. We locked unvested loans out of the industry in 1990 and 1991. But our oversight extends only to the savings and lending industry. It quickly changed and became one of the most notorious companies to offer unverified loans, and not only did it cleverly get ahead of other smaller companies.

I will repeat this crisis again.

It was known early on and could have been prevented much earlier.

Although the warning was given very early on, it was quite clear that no conscientious company would have made such a loan.

So let's take a look at how industry, regulators and prosecutors reacted to early warnings that could have prevented a crisis.

Start with the industry

The industry acted to increase unscreened loans by 500 percent from 2003 to 2006.

It was this loan that caused the bubble to grow to such an extreme degree that it caused the economic crisis.

By 2006, half of what we call subprime loans were unapproved loans.

They weren't mutually exclusive, they just coexisted that way, the most destructive combination imaginable.

By 2006, 40 percent of all loans made in that year, all of which were mortgage loans, were unvetted, according to industry insider fraud experts.

Even though we warned that these loans would create huge fraudsters, it went up to 40%, and the fraud rate went up to 90%, 9-0 (instead of 19).

The industry's reaction to this was, firstly, they started calling these loans, which lacked all the details, unapproved loans.

It was due to a recipe for fraud on the lender's side.

So what happened to the rating fraud?

It has also grown significantly

By the end of the survey of appraisers in 2007, 90% of appraisers reported being threatened by lenders to inflate their valuations.

In other words, both types of fraud, while unique, became commonplace and created a bubble.

So what did government agencies do?

The government, as I said earlier, when we were the Inspector General of Savings and Loans, we could only talk to the industries we served.

As far as Congress goes -- it might sound improbable, but it actually took a smart move in 1994 by passing the Homeownership and Asset Protection Act, which gave the Fed, the Federal Reserve, explicit legal authority to prohibit unapproved loans to any lender, whether they have federal deposit insurance or not.

What did Fed chairmen Ben Banankee and Alan Greenspan do when they were warned of the existence of a huge number of illicit loans and that they were being resold on the secondary market?

There are no shamans who shake off injustice

Once the fraudulent loans start, they have no choice but to build up fraud and resell to the next market, lie about the reputation of the security and the insured.

Fraud spreads to all systems Fraud spreads to all systems, blows up bubbles, leads to catastrophe

this was the fact that we experienced

We've seen huge losses, but we've also seen the behavior of supervisors who had the power to stop this.

Greenspan and Banankee refused to enforce their legal powers to stop unscreened loans.

this was an arbitrary decision

They were vehemently opposed to any regulation.

This could even be described as a global licentious race to not regulate. The United States and Great Britain, especially London, were vying to be the worst. The United States and Great Britain, especially London, were vying to be the worst.

This was the Overseer's reaction

So how did prosecutors react after the economic crisis, after the loss of 11 trillion dollars, after the loss of 10 million jobs, after a crisis with 70 times more losses and fraud than the savings and loan crisis?

When the savings and loan crisis hit, our Savings and Loan Audit Office, the agency that oversees savings and loans, referred to 30,000 crimes and convicted more than 1,000 felonies deemed particularly serious.

About 300 savings and loan institutions and about 600 senior officials were involved.

virtually all were prosecuted

90% of them were convicted

It's one of the most successful prosecutions of crimes committed by white-collar elites, thanks to their understanding of how control fraud and accounting control fraud work.

Now let's turn our attention to the crisis we face now.

The same agency, the Bureau of Supervision of Savings Financial Institutions, was supposed to crack down on many of the major providers of unscreened loans in the country.

The Comptroller of the Currency was tasked with overseeing the largest national banks, but it also didn't report a single case.

Federal investigators haven't filed any charges either.

The Federal Insurance Depository Corporation has shrewdly refused to respond to this issue.

Without oversight guidance, the FBI doesn't have the expertise to investigate complex fraud.

There's no need to invent new ways to bring prosecutions, but they're so forgotten that there's never been a prosecution and, of course, no conviction for bank fraud by elites like Wall Street that caused this crisis.

In the absence of an expert from the regulator, the FBI launched what it called the Mortgage Bankers Association Partnership in 2007.

The Mortgage Bankers Association of America

It's like a trading association that boldly started deceiving the FBI, and it succeeded.

The association invented a definition of collateral fraud, and its members were always victims, never perpetrators.

The FBI took it all in with a grain of salt, from the hook to the weight, and even the rod and the boat.

And the FBI, under the leadership of an African-American Attorney General and an African-American President, applied what the Tea Partyers defined as a "crisis," a completely new type of economic crisis in history in which the upper echelons were impunity.

Very clever people who had haircuts like barbers fooled poor people and banks who lacked financial knowledge.

It's the worst story imaginable, and the FBI steps in to sue the barbers, but completely overlooks the fraudsters inside the bank.

It's like the FBI chasing a mouse while a lion is roaring at a campsite.

What should I do?

What can you do?

We need to change the evil bounty system, because it causes periodic accounting fraud, which causes periodic accounting fraud, causing economic crises.

First of all, we have to destroy the structurally dangerous organization.

too big to crush

First of all, within a few years, we need to get it down to a certain level and not introduce any more systemic risks.

The time bomb timer is still ticking, and if we don't do something about it, it will trigger a global economic crisis.

The next thing we need is a radical overhaul of the modern executive and professional compensation system, because it prevents evaluators from getting what they deserve.

Yes, because of their reward system, they put pressure on the evaluators to create what they call Gresham's Law, in other words, bad money drove good money out of the market.

This is how the injustice spread.

And the third thing that needs to happen is that we have three words that start with D: deregulation, deregulation, and de facto decriminalization.

This three-point review is doable, and if you do it, these three-point review is doable, and if you do it, you can dramatically reduce the frequency of crises and the severity of crises.

If this happens, it will not cause fatal damage to the economy.

And it will help improve social inequality and democracy.

They created American crony capitalism, where the largest financial institutions were major contributors to both the ruling and opposition parties, and so even after this crisis, which was 70 times the size of the savings and loan crisis, there have been no effective reforms in any of the three points I mentioned, except for the ban on unvetted loans, which was a good thing, just one weapon in the arsenal of fraud. It's just one attack vector in the arsenal of injustice.

They have many means of attack.

So we have to learn the best bank robbery recipes that bankers have learned, so that our members of Congress, who depend on political donations, can stop using the recipes to their advantage.

thank you very much

(applause)

Until recently, I was on the California Highway Patrol. I was on the California Highway Patrol.

During most of my 23 years in office, including the Golden Gate Bridge, during most of my 23 years in office, patrol in southern Marin County, including Golden Gate Bridge Patrol in southern Marin County

The Golden Gate Bridge is a symbolic existence of the Bay Area The Golden Gate Bridge is a symbolic existence of the Bay Area The view of San Francisco and the Atlantic Ocean that can be seen from the bridge and the beauty of the bridge itself are known worldwide.

Unfortunately, the bridge is also a suicide hotspot, one of the most frequent suicide sites in the world.

The Golden Gate Bridge opened in 1937

The designer, Joseph Strauss, was reported to have said at the time, ``There won't be any suicidal problems.''

"Suicide by jumping is impossible and unlikely" and "Suicide by jumping is impossible and unlikely"

But since it opened, more than 1,600 people have died from jumping off the bridge.More than 1,600 people have died from jumping off the bridge.

Some people believe that by going back and forth between the two towers that support the bridge, by going back and forth between the two towers that support the bridge, you can reach another world.By jumping off the bridge, you are free from all worries and worries. This bridge has been beautified because it purifies

But let me tell you what really happens when you jump off a bridge But let me tell you what really happens when you jump off a bridge But let me tell you what really happens when you jump off a bridge

After about 4.5 seconds of free fall your body crashes into the water at 120km/h your body crashes into the water at 120km/h

The impact shatters bones throughout the body, some of which pierce major organs The impact shatters bones throughout the body, some of which pierce major organs

Most of the time you die instantly, but even if you survive the crash,

Most of the time it dies instantly, but even if it survives the crash it usually slumps helplessly in the water and drowns.

I think the suicidal jumper doesn't understand how terrifying his or her end will be.

This is the outside girder of the bridge

80cm wide beams run parallel to the bridge except near the two towers 80cm wide beams run parallel to the bridge except near the two towers 80cm wide beams run parallel to the bridge except near the two towers

Most suicides stand on this right before they commit suicide Most suicides stand on this right before they commit suicide

In my experience, in total darkness, once a suicidal person stands on this, it's very difficult to stop suicide.It's very difficult to stop suicide.

This picture, which I took last year, shows a young suicidal woman reflecting on her life to a police officer.

A young suicidal woman is reviewing her life with a police officer. Fortunately, we managed to hold her back.

When I started working at the Golden Gate Bridge, there was no structured training.

I had to struggle and come up with my own way of dealing with it.

This lack of training was not only unfortunate for suicidal people, but also for police officers.

we have made great progress since then

Now we have experienced police officers and psychiatrists who train new police officers. Now we have experienced police officers and psychiatrists who train new police officers.

His name is Jason Garber

I met him on June 22nd of last year, and I got a call that he was sitting on a pipe in the middle of the bridge, trying to commit suicide.

When I rushed to the scene in response to a request, Jason was speaking to another officer. Jason was speaking to another officer.

At just 32, he flew in all the way from New Jersey At just 32, he flew in all the way from New Jersey

The truth is he's already been here twice trying to commit suicide The truth is he's already been here twice trying to commit suicide The truth is he's already been here twice trying to commit suicide The truth is he's already been here twice trying to commit suicide

After about an hour of conversation, he asked us if we knew the story of Pandora's Box After about an hour of conversation, he asked us if we knew the story of Pandora's Box.

According to Greek mythology, Zeus created a woman named Pandora and sent her to Earth with a box Zeus created a woman named Pandora and sent her to Earth with a box and commanded, "Never open that box."

But one day, Pandora's curiosity gave way and she opened the box. But one day, Pandora's curiosity gave in and she opened the box.

All kinds of evil, such as calamity and sorrow, pop out of the box, but all kinds of evil, such as calamity and sorrow, pop out of the box.

Hope was the only salvation left

Jason went on to ask, ``What if you opened Pandora's box and there was nothing left of hope?'''' ``What if you opened Pandora's box and there was nothing left of hope?''''

After some hesitation, he leaned to the right and jumped down.

This kind and intelligent young man from New Jersey has just killed himself.

That evening, I had a conversation with Jason's parents, and to his parents, I sounded like I was really depressed.

That's what Jason's parents asked for.

Suicide has secondary effects on many people Suicide has secondary effects on many people

Now I have a question for the audience: What would you do if your family, your friends, your loved ones, were contemplating suicide? What would you do if your family, your friends, your loved ones, were contemplating suicide?

What do you say?

Do you know what to say?

In my experience, it's important to listen, not just talk.In my experience, it's important to listen, not just talk.

I listen to try to understand

Don't retaliate, don't criticize, and don't say, "I know how you feel," because you probably don't understand how the person feels.

Your mere presence could be the turning point in their lives that they need.

If you think someone is contemplating suicide, don't be afraid to face them and ask.

One way to ask is, "I know someone who tried to take their own life in a similar situation." "I know someone in a similar situation who tried to take their own life."

Face-to-face with the person may save their life and turn their lives around.

Other signs are despair that the situation is out of control and will never get better Despair that the situation is out of control and will never get better Despair that the situation will never get better

I came up with this talk just a few days ago, and I would like to read to you an email I received from a woman.

She lost her son on January 19th of this year.This email was sent to me by her just a few days ago.This email was sent to me by her just a few days ago.With her permission,I would like to read this email to you.With her permission,I would like to read this email to you.

“Dear Kevin, I imagine you're at a TED conference right now.

it must be a great experience

I'm thinking of walking across the Golden Gate Bridge this weekend.

I just wanted to contact you

I hope that you get your message out to a lot of people, and that it goes from friend to friend, to more people. I hope that it goes from friend to friend, to more people.

I'm still stunned, but I'm having more and more moments where my son Mike won't be coming home again.

On January 19th, Mike was driving from Petaluma to San Francisco to watch the 49ers game with his dad.

never got there

That afternoon I called the Petaluma Police Department and they said he was missing. That afternoon I called the Petaluma Police Department and they said he was missing.

The next morning, two police officers came to our house, and the next morning, two police officers came to our house to report that Mike's car had been abandoned at the foot of the bridge.

He was seen jumping off a bridge at 1:58pm the previous day He was seen jumping off a bridge at 1:58pm the previous day

For those who were too weak to stand on their own, even if it was just for a while For those who were so weak that they couldn't stand for themselves

Everyone has been depressed without having a mental disorder Everyone has been depressed without having a mental disorder

It's not easy to stop feeling depressed

God bless your efforts

The Golden Gate Bridge is a passageway across the beautiful San Francisco Bay, a passageway across the beautiful San Francisco Bay, not a graveyard.

Have a nice week, Vicky.”

To go to that bridge and follow in my son's footsteps that day, to go to that bridge and follow in my son's steps that day, to have the courage to continue living the rest of my life is beyond my imagination.

I would like to introduce you to a man I call Hope and Courage I want to introduce you to a man I call Hope and Courage

On March 11, 2005, I received a radio call about a suspected suicide attempt on the sidewalk near the north tower.

I was out there on my bike, and I found this guy, Kevin Belcia, standing on the sidewalk, and I found this guy, Kevin Belcia, standing on the sidewalk.

As soon as he saw me, he quickly climbed over the fence and stood on the narrow pipes that were around the tower.He stood on the narrow pipes that were around the tower.

And for the next hour and a half, I kept listening to Kevin talk about depression and hopelessness, and I kept listening to Kevin talk about depression and hopelessness.

That day, Kevin made the decision to step over the fence again and start a new life.

And I congratulated him on his return And I congratulated him on his return

"This is the beginning of a new life"

But I also asked, "What made you rethink your life with hope?" and "What made you rethink your life with hope."

Do you know what he said?

"Because you listened to me""

"Because you listened to me""

Shortly after that one, I received a letter from Kevin's mother. Shortly after that one, I received a letter from Kevin's mother.

“Dear Mr. Briggs, We will never forget what happened on March 11th, but you are one of the reasons why Kevin is still with us today.

I truly believe that Kevin was crying out for help.

He had been diagnosed with a mental disorder and was receiving appropriate treatment.

I adopted Kevin when he was just six months old, and I was unaware of his genetics at the time, but thanks to God, it's now clear.

Kevin says he seems to be living a normal life.

We thank God from the bottom of our hearts for your existence,

I am deeply indebted to you, Navera Bercia""

And at the bottom of the letter, she wrote, "P.S. When I went to San Francisco General Hospital that afternoon, I saw your name on the patient list.

We have to make sure we don't confuse your name with your son's."

Today, Kevin is a loving father and a social contributor.Today, Kevin is a loving father and a social contributor.

He hopes that by speaking publicly about what happened that day and his depression, he hopes that his story will benefit others by speaking publicly about what happened that day and his depression.

For me, suicide isn't just a professional concern.

it's also a personal matter

my grandfather died by poisoning himself

In doing so, he put an end to his own suffering, but at the same time, I never knew him.

This is the end result of suicide.

Many suicidal and suicidal people do not intend to harm others.

they just want to end their suffering

There are three typical methods: sleep, drugs or alcohol, and suicide.

I've dealt with hundreds of suicides around the bridge I've dealt with hundreds of suicides around the bridge I've dealt with hundreds of suicides around the bridge I've dealt with hundreds of suicides around the bridge

Only two of the cases I was directly involved in failed to deter suicides. Only two of the cases I was directly involved in failed to deter suicides. But two is too many.

one is jason

Another man and I talked for about an hour Another man and I talked for about an hour

During that time he asked me to shake hands three times During that time he asked me to shake hands three times

During the final handshake, he looked at me and said, During the final handshake, he looked at me and said, "I'm sorry Kevin, but I have to go."

and he jumped

It's really really tragic

But I want to tell you that many of the suicidal people we talked to on the bridge didn't kill themselves. Many of the suicidal people we talked to on the bridge didn't.

And even more so, the 1-2% of people who jumped off a bridge and survived often say, The 1-2% of people who survived usually say, The moment I jumped off the bridge, I knew I made a mistake.

This bridge not only connects Marine and San Francisco geographically.This bridge not only connects Marine and San Francisco geographically, it connects people's hearts.

That connection is what each of us must strive to create.It is what each of us must strive to create.

suicide can be prevented

I can save you, there is hope

Thank you for your attention

(applause)

There's this guy, Captain William Swenson, who was recently awarded the Congressional Medal of Honor for his actions on September 8, 2009.

That day, American and Afghan troops were moving through an area of ​​Afghanistan to escort a senior Afghan official on his way to a meeting with a local elder, to escort him.

The column was ambushed and attacked from three sides, and Captain Swenson was particularly credited for rescuing the wounded and recovering the dead from a flurry of bullets.

He was on his way to a rescue helicopter with a buddy to help a sergeant.

I happened to be in a helicopter this day, unlike any other day -- a medic with a small camera on his helmet recording the whole thing.

It showed Captain Swenson and another man carrying a sergeant who had been shot in the neck.

After loading the wounded into the helicopter, Captain Swenson bent down and kissed the man's head before heading back to help the others.

I saw it and thought, Where do people like this come from?

What the hell is that? It must be a very deep feeling to go that far

There's definitely love there, and I wondered why I didn't have someone like that around me.

In the military, medals are given to those who are willing to sacrifice for others.

In the business world, we give bonuses to people who sacrifice others for profit.

Quite the opposite, right? That's why I thought

Where do these people come from?

At first I thought, they're good people.

I was drawn to the military —

Because you're a good person, you're attracted to the spirit of service...

but it was different

I realized that it's the environment that counts, and that we have the power to do great things in the right environment, and more importantly, we all have this ability.

I had the privilege of meeting and talking to these people, the very heroes who risked their lives to save others, and I said, "Why would you do that?

Why did you act like that? ”

They all said, "Other people would have done the same for me."

This is a deep sense of trust and cooperation

Trust and cooperation are important

But the difficulty is that trust and cooperation are feelings, not commands.

Just saying "Trust me" won't make you believe me

Just saying "cooperate" doesn't make you cooperate.

It won't work because it's a feeling

Where does this feeling come from?

If we go back 50,000 years to the Paleolithic era, when Homo sapiens was just emerging, we find ourselves surrounded by a world of danger, where all forces are trying their best to kill us.

It's nothing strange

It could be the climate, it could be the scarcity of resources, it could be the saber-toothed tiger, they're all forces that work to shorten our lifespans.

That's why humans evolved into social animals, living and working together in what I call a circle of trust, a group in which they felt a sense of belonging.

When you feel comfortable in a group, trust and cooperation are the natural reactions.

this has the advantage

When I sleep at night, I have the confidence that someone from my tribe is watching over me.

If you don't trust each other, no one will keep an eye on you

It's a bad strategy for survival.

The same is true in modern times.

The world is full of dangers, full of things that threaten our lives, stifle our success, and rob us of even our chances of success.

The economy is volatile, the stock market is unpredictable

New technology could make your business model obsolete overnight.

Your rival may try to crush you

It can drive you out of business, or at the very least, stunt your growth, and it can go all out -- take your job.

this power can't do anything

Power always exists and never goes away

The only thing we can change is how things are within the organization, and this is where leadership becomes important, because the leader sets the direction.

When leaders are committed to prioritizing the lives and safety of the people within their organizations, sacrificing their own conveniences and tangible results for a sense of security and belonging, great results can be achieved.

I was traveling by air and witnessed an incident where a passenger who tried to board before his number was called was treated like a criminal who broke the law by the gate attendant.

I yelled at you just for trying to board a little early.

so i said

"Why are you treating people like cattle?

Can't you handle it a little more humanly? ”

The official then said

"But if you don't follow the rules, it will become a problem and you could get fired."

I've been told by this clerk that I'm worried.

What she conveyed was a distrust of leaders.

The reason I want to fly with Southwest Airlines is not just because they hire the best people.

because employees are not afraid of their leaders

If conditions are bad, we're forced to spend time and energy trying to protect ourselves from each other, and that's what makes organizations weak.

If there is a sense of security within the organization, we will naturally be able to combine our talents and strengths to work hard, face external dangers, and seize opportunities.

A good leader is like a parent

What does it take to be a great parent?

First of all, give the child a chance, an education, a punishment if necessary, all so that they can grow up and achieve something greater than themselves.

So do good leaders

Opportunity and education, punishment if necessary, self-esteem, failure and challenge, all so that they can achieve more than they ever imagined.

Charlie Kim is the CEO of New York City tech company Next Jump.

it can't be

So why would you consider firing someone in your own organization?

Charlie adopted a lifetime employment system.

If you get a job at Next Jump, you won't get fired for bad grades.

If there's a problem, the company will rather guide and support you, much like parents do to their kids who get bad grades.

in contrast

Many people hold deep anger and hatred toward bank CEOs, who receive unfairly high salaries and bonuses.

the problem is not the money

Because they defy the definition of leadership.

They're violating a deeply ingrained social contract.

Willing to sacrifice his subordinates to protect his own interests, and even more willing to sacrifice his subordinates to protect his own interests.

That's why I get angry. It's not because of the money.

Who would be mad at me for giving Gandhi a $150 million bonus?

How about giving Mother Teresa a $250 million bonus?

Are you dissatisfied?

there's no way out

Good leaders don't sacrifice people for money

They will simply sacrifice their profits to try to save people.

Bob Chapman owns a midwestern manufacturing giant called Barry-Wehrmiller, and in 2008, when the recession hit, orders suddenly dropped by 30 percent.

For large manufacturing companies, this is a matter of life and death, and they can no longer maintain the same level of employment.

We needed to save $10 million, so the board of directors discussed layoffs, as many other companies do.

But Bob refused this

He didn't see his employees as mere numbers.

I was looking at it in terms of the number of minds. Reducing the number of minds is much more difficult than reducing the head count.

So the company created a vacation program.

From secretaries to CEOs - all employees will be taking four weeks of unpaid leave.

Vacations can be taken at any time and do not have to be taken consecutively

The key here was the way the plan was announced.

Bob said, "It's better for everyone to suffer little by little than for some of us to suffer greatly."

The company saved 20 million dollars, and more importantly, as you might have guessed, it created trust and collaboration, which are the natural reactions of employees when they feel safe and protected by their leaders.

And even more unexpectedly, we spontaneously began to accommodate each other's days off.

Those who can afford it trade with those who can't afford it.

So that someone only has to take three weeks off, some people have taken five weeks off.

Leadership is a choice, not a position.

I know a lot of people who are at the very top of their organizations, but aren't really leaders.

They're in power, so everyone follows them, but they don't want to follow them.

On the other hand, I know a lot of people who are at the bottom of the organization, who don't have power, but who deserve to be called leaders, and the reason they are leaders is because they've chosen to look after the people on their left and the people on their right.

This is what a leader should look like

I heard from Marines in the field that there is a tradition in the Marines that the superior eats last.

When they returned to the battlefield -- they would bring a little bit of their own food -- to their superiors, because that often happened.

A leader is someone who takes the initiative

Taking risks before anyone else - humans are the leaders

A leader is a person who makes a choice -- to care for them and make sacrifices so that they can be protected and secure -- and this choice naturally leads people to sacrifice for everyone.

I'm going to shed blood, sweat and tears for everyone to make the vision of a leader come true. Why do I do this?

When asked why they shed blood, sweat and tears for that person, they would answer, "They would have done the same for themselves."

Would you like to work for such an organization?

Thank you very much

Thank you (Applause) Thank you (Applause)

What I am about to tell you may be offensive to some people.

Civilians, of course, suffer in war, and I don't think any ordinary citizen would miss the war in which they were involved.

I've been covering war for nearly 20 years, and one of the most surprising things is how many soldiers miss war.

Why would a man who has endured the worst imaginable experience and finally returned home to his beloved family miss war?

Why? Why?

We must answer this question, or our soldiers will never be able to return to society, and to end war, we need to understand the mechanics of war.

The trouble is, war cannot be told in simple, clear truths; it's very complex and multifaceted.

Any sane person hates war, hates the idea of ​​war, wants nothing to do with it, doesn't want to be near it, doesn't want to know about it.

that's a healthy reaction to war

But if you ask me, have you ever paid to go to the cinema to watch a Hollywood war movie and enjoy it?

This is the complexity of war.

And I'm pretty confident that if peace-loving people feel the pull of war, so do 20-year-old trained soldiers, no doubt.

this is something to understand

As I said earlier, I've been covering war for nearly 20 years, and one of the most intense experiences I've had was the fighting of American soldiers in Afghanistan.

In the '90s, I covered Africa, the Middle East, Afghanistan, but this was in 2007 and 2008, when I was covering American soldiers, and they faced very heavy fighting.

It was in a valley called the Korengal Valley, east of Afghanistan.

It's a small valley about six miles.

There were 150 men in the valley, and they were there for a while, but about 20% of all Afghan fighting was concentrated in just six miles.

150 soldiers were involved in the fighting, one-fifth of NATO forces' fighting in Afghanistan in two months.

it was a fierce battle

My main coverage was at a small outpost -- called Restrepo.

It's named after a medical platoon that had suffered casualties in combat for two months.

Temporary plywood barracks had been built piece by piece on the slopes of the valley, with sandbags, shelters, gun emplacements, and 20 men, combat units of the 2nd Platoon.

I interviewed there for a long time.

no tap water

I can't even take a bath

The men spend a month there

without undressing

just fight and work

Even when I go to bed, I'm still in my combat uniform.

After a month, you will return to your unit's headquarters.

Burn it down and get a new one

no internet, no phone

Completely cut off from the outside world

I can't eat homemade food

There's nothing that young people like. No cars, no women, no TV, nothing. There's only fighting.

And I'm starting to like fighting

It was a very hot day, it was spring, and there was probably no fighting for about two weeks.

Normally, there would be constant raids, but there had been no fighting for two weeks.

The captain walked in front of me, shirtless.

it was unusually hot

He was shirtless and muttered, "God, may there be an attack today."

it was so boring

This is also a war, the captain said, "Please, something will happen-- or I'm going to go crazy."

To understand this, first of all, let's not think about war morally for now.

What exactly is going on in the minds of soldiers in combat?

First of all, the experience of combat is a very strange thing, a very extraordinary experience.

It was a surprise to me too

most soldiers don't feel fear

Of course, the battlefield is a scary place, but when you're there, it's not scary.

There is fear before the battle, fear after the battle is over, and that fear can last for years.

It's been six years without a shootout, but this morning I woke up with a nightmare, dreaming of being strafed by fighter planes, even though it's been six years.

I've never been targeted by a fighter plane, but I have such a terrifying dream.

time starts to flow slowly

Weird Tunnel Vision Appears

I remember certain scenes in detail, but not others.

there is a slight change in the mind

Soldiers' brains are flooded with adrenaline.

For young men, this state lasts for quite some time.

This is a function that humans are born with.

It's caused by hormones

Young men are six times more likely to die from violence and accidents than women.

Men are six times more likely to die than women.

Statistically, it's statistically more dangerous for a teenage boy to wander around the neighborhood wondering what to do today than to be a firefighter or a police officer in most American cities.

You can easily imagine what it would be like on the battlefield.

Anyone could have died in Restrepo, including me, of course, including my good friend Tim Hetherington, who was later killed in action in Libya.

The uniforms of the surviving soldiers were also riddled with holes from the shooting.

One morning, I was resting on my sandbag, and I thought I was going to take a little break, and suddenly sand hit my cheek -- sand splattered from the side.

At first I didn't know what was flying

So a little bit about guns, bullets go much faster than sound. If someone shoots you from a few hundred meters away, it takes less than half a second for the bullet to reach you. The sound comes later.

About 0.5 seconds have passed since the sand hit my face

I heard a sound

it's a machine gun

After that shooting, an hour-long shootout began.

The first shot hit me three or four inches to the side of my head.

Just imagine, I can remember exactly.

Three inches off at 400 meters, miraculously saved.

Everyone who's been on the battlefield has had a similar experience -- at least once -- a lifetime experience.

The young soldiers spent a year there

I will return

Some who leave the military later suffer from severe mental illness.

There are also people who say that staying in the military is fine, to some degree, mentally.

I was interviewing a soldier named Brendan O'Brian.

I'm still good friends with him

he was discharged after returning home

one night at a dinner party

I invited him in. He was talking to a female friend of mine, and she knew how hard the battlefield was, and she said, "Brendan—" "Going to war in Afghanistan, and even just one thing—" "Is there anything that you wish you could have done?"

He thought for a moment and then replied, "I miss war so much."

He's one of the most traumatized people I've ever interviewed.

“I miss war so much”

What does it mean?

he is not a psychopath

I don't want to kill people

He's normal. He doesn't want himself shot or his friends killed.

What does he miss? We have to understand that, we need to know the answer to end the war.

I think what he's looking for is friendship.

So this is the exact opposite of killing.

What he misses is the bond he had with his comrades who fought alongside him.

This bond is different from friendship

Friendship is born in society

When you fall in love with someone, you try to do something for that person.

Bonds with friends are different It doesn't matter what you think of others

It's a mutual willingness to act for the purpose of the group, and we can even sacrifice ourselves for the safety of the group.

So it's like, "Love your fellow man more than you love yourself."

Brendan was the leader of a unit, a unit of three, though he nearly died many times during those hellish days in Afghanistan.

it was nothing to worry about

For him, the worst thing that happened in Afghanistan was when his men were shot in the head, and everyone who saw them go down with their helmets shot.

I thought I had no life

I was in the middle of a big shootout

No one was there to help, but minutes later -- Kyle Steiner got up, and he regained consciousness, as if he had risen from the dead.

Although I fell with a gun

The bullet had hit the helmet

He could hear the voices of his comrades, he must have been half conscious, and what he heard was, "Steiner was shot dead in the head."

he thought, "I'm not dead yet"

and got up

Later, when Brendan found out about it, he realized that he had failed to protect his men, and that was the only time he ever cried in Afghanistan.

This is the bond between friends

I've had this feeling for a long time

Have you ever read The Iliad?

Achilles risks his life to save his friend Patroclus.

There were many examples of this during World War II, when soldiers wounded in battle were taken to field hospitals and escaped, trying to avoid being seen through windows and doors without permission, still injured, and then returning to the front lines to join their comrades.

Brendan, who I mentioned earlier, and all the other soldiers, have this in their hearts. Love for 20 comrades in a small group. Love beyond love for yourself. Imagine how beautiful it is. I don't know

this is horrible

In comparison, war can be a place of psychological comfort for them, a feeling of social alienation that plagues them.

This is the answer, what we have to understand, why we have to change society.

Thank you for your attention

(applause)

What is history?

it was written by a winner

There's this idea that history should focus on rulers, like Lenin and Trotsky.

As a result, people in many countries, including my own country, Russia, have a perception that history is pre-determined or pre-determined by their leaders, and that ordinary people cannot influence it.

Today, many Russians do not believe that Russia could or could become a true democracy, because to them history is framed in this way.

and this is not true

I spent two years proving that, going back 100 years, to the year of the Russian Revolution of 1917.

What if the Internet and Facebook existed 100 years ago? thought

So last year, we set up an online network for the dead, we called it Project1917.com.

My team and I developed our own software to digitize and upload all available diaries and letters written by over 3,000 people over 100 years ago.

On our website and app, you can follow the events of that day in 1917 in chronological order, and read what Stravinsky, Trotsky, Lenin, Pavlova and many others thought and felt.

We see images of ordinary people like you and me, not deified people, and we also see that history contains their failures, their fears, their weaknesses. Not just "genius ideas."

Our project shocked many Russians, because they believed that our country was an empire that would always run a tyranny, and that freedom and democracy would never triumph. Democracy was far from us.

But if we take a broader view, it's not such an extreme story.

Indeed, from 1917 onwards, there was a communist dictatorship for 70 years.

But this project showed that Russia could also have a different history, a future as a democracy that other countries could and still can.

If you read a post from 1917, you'll find that Russia was the first country in the world to abolish the death penalty, and one of the first countries in the world to allow women to vote.

If we know history, and if we understand how ordinary people have influenced history, then we can build a better future, because history is only a rehearsal of what is happening now.

We need new ways to tell history.For example, this year we launched a new online project called 1968Digital.com.

We're trying to bring that history back to life, by imagining what it would be like if the protagonists of history could use mobile phones.

just like this

Many people faced similar problems and fought for the same values, regardless of whether they lived in America or the Soviet Union or France or China or Czechoslovakia.

By exposing history in a democratic way through social media like this, we can show that those in power aren't the only ones making the final decisions.

Anyone can turn history upside down.

ordinary people matter

they have influence

the way you think is important

Journalists, scientists and philosophers are important too.

Together we shape society

we are all making history

thank you

(applause)

I'd like to talk about a project that has a special place in my heart as an invention.

It's the most exciting thing I'm working on right now, and it's very simple.

could have an immeasurable impact on the world

It's actually tackling one of the biggest health problems on the planet, the number one killer of children under the age of five.

Is it a water-borne disease?

Diarrhea or malnutrition?

wrong! The number one cause is smoke from indoor cooking.

It's an acute respiratory infection Can you believe it?

I was quite shocked and appalled

Couldn't we create a less harmful cooking fuel?

Could we develop a safer stove?

So what exactly causes 2 million deaths each year?

Bill Joy talked about the wonders of charcoal nanotubes, so I'm going to talk about the big carbonized tubes, the wonders of charcoal.

This is a picture of rural Haiti 98% deforested

In fact, scenes like this are common in Haiti.

Deforestation causes many environmental problems that will eventually affect everyone living in Haiti.

A few years ago there were severe floods that killed thousands of people because the forests that protected the soil disappeared from the hills.

When it rains, the rainwater fills the rivers and causes floods.

One of the reasons we've lost so much forest today has to do with the way people cook, and people cut down trees to make charcoal.

It's not because people have never been oblivious to environmental issues.

On the contrary, they all understand it very well, but the reality is that they don't have any other choice.

Fossil fuels aren't readily available in Haiti, and the sun doesn't cook delicious food.

So we have this situation

It's not uncommon to see families like this in Haiti, they go after trees, they go to the forest, and they cut down trees and make charcoal.

Needless to say, a lot of effort is going into finding alternative fuels for cooking.

About four years ago, I brought a team of students to Haiti to work with Peace Corps volunteers.

Among them was this volunteer: This is a device he built in his village.

The mechanism is to compress waste paper into a mass that can be used as fuel.

Unfortunately, the device was very slow.

So a group of engineering students started making simple improvements, and it actually went three times faster.

It's easy to imagine how delighted the students were.

The students brought the fuel back to MIT for experiments.

What we found in the lab was that this chunk didn't burn.

the students were a little shocked

In fact, if you look closely at the blob, you can see it right here, and it says, "United States Peace Corps."

In fact, waste paper did not exist in this village.

It's a rare example of "reuse" of the US government papers that these volunteers brought back to the village, but (Laughter) because the US government papers were 800 kilometers from the village.

So I felt the need to come up with an alternative fuel for cooking in some other good way.

What we wanted to achieve was the production of fuel using raw materials that were readily available in the region.

It's a small sugar refinery that's common in Haiti.

The residue left after the juice is extracted from the sugarcane is called "bagasse".

Bagasse is useless for anything else, because it has no nutrients left.

cannot be given to livestock

It's just piled up next to the sugar refinery until it's incinerated.

What we wanted to do was find a way to take advantage of this recyclable waste and turn it into a fuel that people could easily cook like charcoal, just like charcoal.

So I spent a few years immersed in research.

We started with a simple kiln made from 55-gallon oil drums that collected sugar cane crumbs.

After a while, the kiln is fired and sealed to keep oxygen out of the kiln, resulting in a carbonized material.

But as it stands, it can't be used as fuel.

It is not suitable for cooking because the particles are fine and burn out in an instant.

Continuing research for further practical application

Luckily, one of the students was from Ghana, and he remembered a dish his mother used to make called "kokonte," which was like a very sticky porridge and made from cassava root.

We did some research on cassava and found that it's also grown in Haiti under the name "manioc."

In fact, cassava was grown all over the world. Yucca, tapioca, manioc, cassava are all one and the same. It's a very starchy root vegetable.

You can use it to make a very thick, sticky porridge, and you can also use this porridge to hold carbonized sugar cane crumbs together.

That's exactly what we invented, and we immediately flew off to Haiti.

They were the first graduates of the "Ecole des Chabons," the charcoal school, and

(Laughter) -- yes, I teach at CIT as well as at MIT.

and this is what we made

Let's take you to another continent! this is india

This is cow dung, a common cooking fuel in India.

It's really smoky, even more so than Haiti, and you can see how cooking with cow dung and biomass as fuel can have serious health consequences.

Children and women are especially vulnerable, because they're the ones on the cooking fire.

We wanted to see if we could introduce the technology to make this charcoal in India.

But in India, there was no sugar cane, no cassava, but we didn't give up.

I immediately researched the biological resources (biomass) available in the area.

In India we had wheat straw, we found rice straw.

The binder was a small amount of cow dung, which was originally used as fuel in India.

We ran various comparative tests, and we got a lump of charcoal, which is cow dung.

You can see that this is a much cleaner cooking fuel.

It's really quick to boil water.

Up to this point it was as expected

Later it turned out that when we did a side-by-side test with charcoal, we found that the burn time was shorter, and the mass was a little more brittle, even during cooking.

It was also found that the combustion power gradually weakened

We wanted to find a way to make a more competitive and durable fuel that could compete with charcoal made in Haiti.

I quickly returned to MIT and used an Instron experimental machine to scrutinize the optimal compression ratios to create a better performing mass of fuel.

In the lab, students validated, and in parallel, in Haiti, regional partners worked to improve the process so that it could be rolled out in India.

Then they developed a cheap press to make the fuel, and the finished fuel burned longer and was more hygienic than charcoal.

We've finally succeeded in creating a fuel with higher performance than any fuel that can be bought and sold on the Haitian market.

Unfortunately, in Haiti alone, 30 million trees are destroyed each year.

If this project is implemented, it has the potential to save most of the trees.

In addition, the profit from fuel is 260 million dollars.

That's a lot for Haiti -- for a country with just eight million people and an average income of less than $400.

After Haiti, we were able to promote charcoal fuel projects in India.

Interestingly, I have a friend at the University of California, Berkeley, who specializes in risk analysis.

He studied the health hazards of burning wood and charcoal.

According to his analysis, changing the cooking fuel from wood to charcoal around the world would kill a million people.

I've discovered that it can be prevented. What a wonderful discovery indeed! Until now, the only option was to cut down trees.

But now we have the means to turn agricultural waste into cooking fuel.

I am very excited about this episode from my trip to Ghana last month.

That's amazing! It was done with more primitive technology than a charcoal-fueled project, can you imagine? It is this

What is it? Carbonized corn cob

And what's even nicer is that it's so easy to handle that you don't have to clump it up -- it's in raw form, which is my laptop.

I brought a sample like Nick

(Laughter) Please turn it around with everyone in the venue.

Functional, field-tested, ready to ship

The great thing about this technology is that it can be easily transferred.

In the case of carbonized sugarcane, you need to train technicians to turn the fuel into clumps, and you need a lot of work to make the glue, but it's a clump from the start.

So right now, it's the most exciting thing in my life.

(Laughter) But once you pick it up, it's like everyone in the front row.

(Laughter) -- that's what Robert Wright said

I think it's a perfect example of not a zero-sum game.

In addition to health benefits, there are also environmental benefits.

And, very implausibly, there are even economic benefits.

We can make cooking fuel from scrap wood

and you can earn

Money that would otherwise have been spent on charcoal can now be put into savings, and the surplus charcoal can be sold through the market to people who cannot make charcoal.

Relationships without tradeoffs between health and the economy, and the environment and the economy, are very rare.

So this project is not only very exciting, but I'm very excited to see how far we can go with this project.

Now, as we envision the future we're about to create, what we need to do is to fully understand where we are right now.

It doesn't just mean the situation that "we" are in right now.

Recognize that in some parts of the world there are situations where women spend two to three hours a day milling grain to feed their families.

Recognize that in some parts of the world, advanced building materials mean ceiling tiles made of handcrafted cement, and in other parts of the world, you can work 10 hours a day and earn only $60 a month.

So the reality is that women and children spend 40 billion hours a year fetching water.

In other words, the amount of time every working person in California spends a year doing nothing but fetching water.

If this venue was India, it would only allow three people to have a car.

If this venue is Afghanistan, it's a world where only one person knows how to use the Internet.

If this venue is Zambia, 300 farmers and 100 people with AIDS.

And more than half of the people in this room live on less than a dollar a day.

It is these fundamental problems that need a "solution".

We need to educate our engineers, our designers, our businessmen, our entrepreneurs, to be aware of these issues and to address them.

that's exactly the solution we have to find

I personally think that the areas that deserve special mention are

One is technological innovation to promote microfinance and small businesses, which should help the poor people get out of their current predicament.

But now there are new technologies and products that can start small.

Our next goal is to create technology that adds value to crops for poor farmers.

We need to go back to basics and rethink our strategies. Instead of trying to get farmers to pursue a career outside of farming by giving them higher education, we should arm ourselves so that we don't end up as poor farmers.

We should figure out a way to deploy this efficiently.

People living in these poor neighborhoods must be given the right resources and tools to solve their own problems, and that's the best solution.

We can't help them solve their problems by helping them from the outside.

In order to create such a vision of the future, we must work together now.

Thank you for your attention

(applause)

Chris Anderson: Well, while we're checking to see if anyone else has questions, can we ask about any other projects you've worked on?

AMY SMITH: Another project is the development of low-cost water testing methods. That way, people in a society can manage their own systems, and know when they are up and how they are handled.

We are also investigating low-cost water quality control systems.

One really remarkable thing is the disinfection of water by the sun. and improved sterilization.

CA: Are there any issues with scaling?

Need to find an entrepreneur or investor? What do you need to do to scale up?

AS: Well, a lot of people are working hard to move the project forward.

Scaling up is difficult. The people in need are the fragmented people with no income.

So the American way of doing things doesn't work.

Also, there are very few staff. Actually, I'm the only one.

(Laughter) So, what I can do is try to reach out to the students.

As many as 30 students go to the site every year and try to implement and move forward.

We are also acting in the long term. I don't think it will be resolved in 2-3 years. We must look five or ten years ahead.

With such a vision, we believe that we can move forward.

I was going to tell you about my new book. . . It is a book about intuitive judgments and first impressions called "first feeling"

It will be published in January, so please buy all three books at once.

But... I'm happy to have my book published, and I think my mother will be happy, but everyone's happiness.

It's not a story. So today, instead, I'm going to tell you about a man who has contributed more to the well-being of Americans than anyone else in the last 20 years. A hero to me.

Howard is short, chubby, in his 60s, wears big glasses, has balding hair, but is very energetic and full of vitality.

His job is a psychophysicist

I don't really know what psychophysics is, but once I dated her for about two years, she was also doing her PhD in psychophysics.

This might say something about their relationship. (Laughter)

I understand that psychophysics is about weighing things

Howard has a keen interest in weighing

After getting my PhD from Harvard University, I started a small consulting firm in White Plains, New York.

Back in the '70s, one of my first clients was

it was pepsi

Pepsi came up to Howard and said, "I'd like to make Diet Pepsi with new artificial flavors.

I want to find out how much artificial flavoring you need to add to make the perfect Diet Pepsi."

It sounds like a deceptively simple question, and Howard thought so too.

'We think between 8% and 12%,' said Pepsi

"If it's less than 8%, it's not sweet enough, and if it's over 12%, it's too sweet.

I want to know where between 8% and 12% is the most delicious."

Sounds easy, right?

Have a large batch of Pepsi and vary the sweetness Start at 8.1%, 8.2%, 8.3% and up to 12% and have a large group of people taste it Graph the results to find the most popular concentration. it's very easy

Howard did that experiment and graphed the results, but it didn't turn out to be a bell curve like you'd imagined.

the graph is meaningless

It's messy and disjointed

People who work in food testing wouldn't be upset if the data was all messed up.

Coke's taste is not simple, or

I think I made a mistake somewhere

They'll pick the middle 10% by saying let's try to come up with a plausible answer.

But Howard doesn't agree

Howard's intellectual standards are high

I was not satisfied with this result.

Many times I wondered what was wrong

Are the results of the Diet Pepsi experiment incoherent?

One day, I was in a diner in White Plains, thinking about my job at Nescafé.

Like an electric shock, I came up with the answer

So when I analyzed the Diet Pepsi data, I was looking for the wrong thing.

I was looking for the perfect Pepsi, but I should have been looking for the perfect Pepsi guys.

this is a great find

One of the greatest breakthroughs in the food science industry

I went to conferences all over the country to teach people, and I gave a talk where I said, "I was wrong in my search for the perfect Pepsi.

You're looking for the perfect Pepsis."

The audience was dumbfounded and said, "What are you talking about? You're crazy."

not dealt with

After that, the client disappeared, but the Howard obsession didn't end.

His favorite proverb is "For bugs living in rapeseed, rapeseed is the whole world."

This is Howard's vegetable leaf (lol) I was obsessed

And finally found a breakthrough. It's Vlasic Pickles.

"Mr. Moskowitz, uh, Dr. Moskowitz...

I would like to make the perfect pickle.” He replied, “There are no perfect pickles.

I researched and reported. “We need to not only improve the regular pickles, but also make spicy pickles.”

That's where the tangy pickles begin

Next client was Campbell Soup

This time it was even more important

Because this made Howard famous

In the 1980s, Campbell's product Prego lost to its rival Ragu Ragu sold overwhelmingly in the 1970s and 1980s

I don't know if you're interested, but do you have time?

Prego is a better quality tomato sauce than Ragu.

The quality of the tomato paste, the blend of spices, and the entanglement with the pasta are all excellent.

In the famous Raghu and Prego experiment in the 70's

Pour each sauce over the pasta on the plate

The ragout will fall to the bottom, but the prego will sit on top of the pasta.

This is called adhesion

Anyway, even though the adhesiveness is excellent and the quality of the tomato paste is good, Prego was struggling.

That's why I asked Howard for help.

Howard saw the product and said, "This is no good."

And say, "I would do this."

I made 45 different pasta sauces in Campbell's kitchen.

It's all you can think of when it comes to types of tomato sauce: sweet, garlicky, sour, tomato.

I made every variation I could think of.

Then pick it up and run around the country

New York, Chicago, Jacksonville Los Angeles, etc. And gather a lot of people in the hall

We had them try 10 different pasta sauces in a 2-hour tasting.

10 small plates of pasta with different sauces

After tasting, have each pasta rated on a scale of 0 to 100 How good was the pasta sauce?

After doing this for months and months, I came back with an enormous amount of data about what kind of pasta sauces Americans like.

and analyzed

Looking for the most popular pasta sauce? wrong!

I don't believe Howard is the most popular

Instead, I suggested that we look at the data and divide it into groups.

Let's see if we can find any distinctive groups

If you look closely at the pasta sauce data and analyze it, Americans can be roughly divided into three groups.

A group that likes simple pasta sauce A group that likes spicy pasta sauce A group that likes pasta sauce with chunks of tomato

Of these three, the third is the most important one, because when this experiment was done, in the early 1980s, you wouldn't be able to walk into the supermarket and buy pasta sauce with lumps.

Prego asked, "A third of Americans want chunky pasta sauce, and no one makes it?" Howard said, "Yes."

(Laughter) Prego then reinvented pasta sauces, and as soon as they launched chunky sauces, they became the number one pasta sauce industry in the country.

It was pasta sauce with chunks that generated $600 million over the next decade.

People in the industry saw Howard's work and said, "Oh my god! We were wrong!"

As a result, 7 varieties of vinegar, 14 varieties of mustard and 71 varieties of olive oil were created.

Raghu then asked Howard to work for him, and Howard did a similar experiment with Raghu.

How many types of ragout pasta sauce are there in the big supermarkets today? . .

Can you imagine? 36 types!

There are 6 series, cheese flavor, light, robust rich & hearty, traditional, garden style with lumps (laughs).

Howard's work. It's a gift from him to all Americans.

Why is this important?

It's actually very important. I'll explain

Howard fundamentally changed the way the food industry thinks about how to make people happy.

The first premise of the food industry used to be that if people knew what they wanted to eat, ask them.

Over the years, Raghu and Prego invited people to do focus groups and asked them, "What kind of pasta sauce do you like? Tell me what your favorite pasta sauce is."

Over the years, 20, 30 years, in many focus groups, no one ever said, "Sauce in chunks."

1/3 of people would have wanted it deep down

(Laughter) I don't know what I want!

"The mind doesn't know what the tongue wants," Howard often says.

Isn't it strange

An important first step in understanding desires and preferences is recognizing that we can't always explain what we really want.

For example, if I asked everyone in this room what kind of coffee they like, they would probably say, "Dark, rich, deep roasted coffee."

When asked, everyone always answers in unison

Dark, rich, deep roast!

What percentage of people really like dark, rich, deep-roasted coffee?

According to Howard, 25-27%

Most people like light coffee with milk.

But you never say that when asked, right? "I like light flavored coffee with milk" (laughs)

This is Howard's greatest achievement

Howard's second achievement, which is also very important, is that it made me realize the importance of horizontal segmentation.

Why is it important?

Before Howard, the food industry thought this way.

In the early '80s, everyone was obsessed with mustard

I was particularly fascinated by the story of Gray Poupon.

In the past, there were only French and Gulden

yellow mustard

Yellow mustard seeds, turmeric and paprika. that was mustard

"Dijon" of gray poupon appeared there

brown mustard seeds, white wine, pungent spiciness

A much more delicate scent. And what happened?

It's in a little glass jar with an enamel label, and it looks like it's made in France, but it's actually made in California.

They put an eight-ounce bottle at a price of $4 instead of a dollar and fifty cents like French or Gulden.

As I was eating, another one came up to me and said,

"Can I have some gray poupons?"

Sales of Gray Poupon soar after this

The top of the mustard industry!

The lesson that others learned was how to make people happy: to offer luxury that everyone aspires to.

Making you think you might not like what you think you like at the moment Standing at the top of the mustard world pyramid

better mustard! Higher grade mustard!

A sophisticated, cultured and meaningful mustard

Howard said, "You're wrong!"

There's no pyramid in the mustard world

Like tomato sauce, mustard is on a horizontal level.

There is no good mustard or bad mustard

There is no perfect mustard or imperfect mustard

There are just different mustards that suit different people's tastes

He democratized the idea of ​​taste preferences.

Thanks to Howard Moskowitz

Howard's third achievement, perhaps the most important, was his challenge to platonic notions of cooking. (Laughter)

what does it mean

For years, the food industry believed there was only one way to cook the perfect dish.

Let's say you go to Chez Panisse and are served red tail sashimi with roasted pumpkin seeds and some kind of simmering sauce.

There aren't even 5 types of simmered sauce, right?

No one asks if you want a simmered sauce with lumps or...

The stewed sauce made by the chef of Chez Panisse is served, isn't it?

Because the chef has an ideal image of red tail sashimi.

this should be

And she makes it that way every time.

The same was true for the food industry.

I have one ideal image for tomato sauce

Where did it come from? Italy

What about Italian tomato sauce? It's watery

Traditional tomato sauce was watery

The real tomato sauce in the 1970s was Italian tomato sauce. It's an early ragout.

A watery sauce that all pools to the bottom when poured over pasta

Why were you so obsessed with that kind of sauce?

You need real tomato sauce to make people happy

I thought so

I thought everyone would be happy if I served authentic tomato sauce.

That's the way to please the greatest number

The reason I thought so was that people in the culinary world were looking for universality.

I was looking for a way to please everyone.

It's understandable that they're obsessed with the idea of ​​universality, because for most of the 19th and 20th centuries, science was obsessed with universality.

Psychologists, medical scientists, economists were all interested in the laws that govern our behavior.

but that has changed

What is the biggest change in science in the last 10-15 years?

It is about understanding diversity rather than pursuing universality.

In medicine, it's less about how cancer works than how it's different from other people's cancers.

my cancer is different from yours

Genetics opened the door to the study of human diversity.

This is the same revolution in the tomato sauce industry that Howard Moskowitz did.

I would like to thank him from the bottom of my heart

Another example of diversity

This didn't convince Howard, and he went on to dig deeper, saying that seeking universal food principles is not only wrong, it's even harmful.

Howard cites coffee as an example

because he did a lot of work with Nescafe on coffee

Let's say I'm asked to create a coffee brand. . . It's a coffee that everyone likes, and if you were to rate that coffee, the average score would be around 60 out of 100.

But if you're willing to divide into groups, say three or four coffee groups, and then make coffees to suit each group's tastes, the rating will go from 60 to 75 to 78.

The difference between a 60-point coffee and a 78-point coffee is as big as a shudder-bad coffee and a sigh-happy coffee.

This is Howard Moskowitz's greatest lesson: we can find true happiness by embracing human diversity.

thank you

The underlying theme of TED, compassion, has stuck with me. There were a number of inspiring talks, like HIV in Africa and President Clinton's speech last night.

Along with that, I'm going to talk about compassion, moving from the global scale to the individual level.

I'm a psychologist, but don't worry

I'm not going to touch the scrotum. (Laughter) There was a very important study that was done a little while ago at Princeton Theological Seminary that asked why, when we have the opportunity to help people, we either help them or we don't.

Divinity students at Princeton Theological Seminary were told they were going to practice sermons, and they were each given a sermon topic.

Half of the students were given the fable of the "Good Samaritan," the story of a man who helped a stranger on the side of the road in need.

The other half were randomly assigned another theme from the Bible.

And they were told to go to different buildings one by one and preach.

As you move from one building to the next, there's a man on the side of the road, hunched over and moaning, clearly in need. Did the students stop and help him?

A more interesting question to ask is, does contemplation of the "Good Samaritan" parable change student behavior? The answer is "no change"

It turns out that whether or not someone stops to help a stranger in need depends on how rushed they feel, how slow they feel, how engrossed they are in what they're about to say.

I think this is a reflection of the circumstances in our lives: our minds are headed in the wrong direction, and we always miss the opportunity to help someone.

There's a new branch of brain science called social neuroscience.

It's a field that studies the neural circuits that are active when two people interact.

The new way of thinking about compassion from social neuroscience is that our brains are fundamentally wired to help.

So when you give someone your attention, you automatically empathize and read their emotions.

When a newly discovered mirror neuron that acts like a neural wireless LAN is active in one person's brain, it's also active in the same place in the other person's brain, automatically feeling "together."

So if someone is needy or distressed, we automatically try to help them, at least in theory.

But here's the question why not actually do it?

This question runs the gamut of sheer narcissism, awareness of others, empathy and compassion.

The simple fact is that if we focus on ourselves, as we often do all day long, then if we're preoccupied, we can't focus enough on others.

This distinction between self-awareness and other-awareness is very subtle.

I was filing my taxes the other day, and as I was listing the donations I had made, I had an epiphany when I saw the Seva Foundation check and realized that my friend Larry Brilliant would be very happy that I had made a donation to the Seva Foundation.

What I got by giving was narcissistic, I was feeling good.

And then I started thinking about the people in the Himalayas who could get cataract treatment, and I realized that instead of being narcissistic, I started having altruistic joy and good feelings for other people.

I think we should be very careful to distinguish between this self-directed consciousness and the other-directed consciousness.

When you think about dating, you realize that this is universal.

A while back, I went to a sushi restaurant and overheard two women talking about one of them talking about dating her brother.

The women sit at the table, and the men across from them take turns changing seats. Every five minutes, a bell rings to signal the end of the conversation, and the woman decides whether or not to give the man his business card and email address.

When he sits down, he keeps talking about himself and not asking women questions."

An article in the Sunday Styles of the New York Times was investigating the backstory of marriage.

The test consists of how long it takes from the moment the two meet to the time the man asks a question that includes the word "you."

And yes, Epstein took advantage of that test because it made it into the article.

(Laughter) This is a quick, simple test that you can try at your party.

TED is a great opportunity

The Harvard Business Review recently published an article called "Human Moments," on how to build authentic relationships in the workplace, and the article says that the first step is to turn off your phone, shut down your computer, stop daydreaming, and give the other person your full attention.

A new English word has been coined to describe a situation in which the person you're with suddenly starts using your cell phone and your presence is ignored.

It's the word pizzled, a combination of "annoyed" and "annoyed."

(Laughter) That's right. What separates us from Machiavellianists and psychopaths is our empathy.

I have a brother-in-law who is an expert in terror. He has written books on Dracula and Frankenstein. He is a Chaucer scholar.

Anyway, my brother-in-law Leonardo decided one day to write a book about a serial killer.

The man who terrorized this neighborhood many years ago, known as the Santa Cruz Strangler.

Before being arrested, the man had killed his grandparents, his mother and five female students at the University of California, Santa Cruz.

When my brother-in-law met the man for an interview, he was terrified.

He was 210cm tall

But that's not his scariest thing

The man had an IQ of 160. He's a veritable genius.

But the correlation between IQ and empathy, the ability to read people's emotions, is zero.

These two are controlled by different areas of the brain.

Eventually, my brother-in-law decided to take the courage to ask the question he wanted to ask the most: "How could you do that?"

"Didn't you feel pity for the other person?"

he strangled his relatives

The strangler casually said, "No, if I was feeling uncomfortable, I couldn't have done that.

I turned off that part of myself."

This is a very nasty thing, and in a way I've been thinking about turning off parts of myself that way.

If we concentrate on something, our awareness of other people is turned off even if someone is present.

Think about the possibilities of mindful consumption when you shop.

As McDonough pointed out earlier, there are causal relationships that we don't see in the things we buy and use.

We are all unwitting victims

We're not paying attention to the toxic substances that our carpets and chair fabrics give off, and we're not paying attention to the fact that we're not paying attention.

We don't care about the ecological, public health, social and economic impacts of what we buy and what we use.

Even though there is a problem in the environment in which we live, we who are not even aware of it are victims of the mechanisms that are pointed out in various places.

There's a great book about the inside story of the everyday items we use.

We take up products such as T-shirts

It also looks at where the cotton is grown, the chemical fertilizers used, and its impact on the soil, and points out, for example, that cotton is so difficult to dye that 60 percent of the dye ends up in wastewater.

It's well known by epidemiologists that children who live near textile factories have higher rates of leukemia.

There's a company called Bennett & Co., which sells fabrics to Ralph Lauren and Victoria's Secret, and the CEO of this company, aware of this fact, set up a joint venture in China to ensure that waste water is properly treated before it's returned to the ground.

At this time, we have no way of distinguishing between socially acceptable t-shirts and non-socially acceptable t-shirts.

My idea is to introduce new electronic tagging technology into every store that knows what happened to what's on the shelf.

And if you can trace that product to the factory, and if you trace it to the factory, you can look at the manufacturing process that made that product, and if it's socially appropriate, you can tick off the product.

for people with peanut allergies

The site provides product information

That means you can make thoughtful choices when you buy.

There's a well-known saying in computer science, "In the end, everyone will know everything."

Will that make a difference?

When I was working for the New York Times in the '80s, I wrote an article about a new problem in New York at the time: homeless people on the streets.

For a few weeks, I went to work with the Department of Social Services to help the homeless, and I saw homeless people, and through their eyes, I realized that most homeless people were mentally ill patients with nowhere to go. They had symptoms.

They don't take action because they don't notice

Shortly after that, one Friday, after work, I was heading down to catch the subway, and it was rush hour, and thousands of people were pouring down the stairs.

As I was walking down a flight of stairs, I suddenly noticed a man hanging down on his side, naked to the waist, motionless, and people just stepping over him, hundreds and thousands of people.

Somehow, my urban sickness was waning, and I found myself stopping and trying to solve the problem.

As soon as I stopped, six people gathered around the man.

He was Hispanic, didn't speak English, and had no money.

Right away, someone went to buy orange juice, someone brought a hot dog, and someone called the cops.

the man was able to stand up quickly

It all happened from the simple act of noticing. I'm still optimistic.

thank you very much

(applause)

Like almost anything, the most romantic experiences I've had online started offline without me.

December 10, 1896 Alfred Nobel died

Exactly 100 years later, on December 10, 1996, this charming woman, Wislawa Szymborska, was awarded the Nobel Prize for Literature.

she is a polish poet

He's a great man, but I didn't even know his name at the time, but when I read his work, I found this wonderful poem, "Four in the Morning."

"When night becomes day—

time from right to left —

Time for people over 30..."

It goes on like this, but the minute I read it, I was totally hooked, to the point where I thought I had met him somewhere before.

Did you join me in the elevator?

Did you woo this poem at some coffee shop?

I couldn't remember, and it was frustrating, but a week or two later, I was watching an old movie and I came across this scene.

(Grucho Marx) I wish you had come to the party

I was excited until about 4 o'clock in the morning

When my roommate turned on the TV, this was the scene

(Theme music from "Seinfeld") (George Costanza) I watched the "Omen" trilogy until four o'clock in the morning.

When I listen to music, a song like this...

(Elton John) ♪ Shit! It's already four in the morning, isn't it?

The demigod called "coincidence" must have been teasing me

Some people can't get the numbers out of their heads, some say it's the name, some say it's the music.

I didn't tell anyone because I thought if I left it alone, it would go away eventually, but it didn't go away, so I decided to tell you everything.

I was invited to TED for the second time in 2007, but I didn't really have a specialty, so I thought, why not give a multimedia presentation about very limited, insignificant, trivial things?

So I shared with you some of the "four o'clock in the morning" examples that I had collected, including some from the performers that year.

I found 4 in the morning in Isabel Allende's novel.

I also found a great example in Bill Clinton's autobiography.

I also found two of Matt Groening's work, but I later heard from him that he couldn't see my talk because it was in the morning session.

But if Matt had been there, I'd have ended up listening to some very strange and incoherent pseudo-conspiracy theory.

The story was made for the venue, just for the moment.

That's what everyone did until TED.com came along.

it was a lot of fun

But when I got home, I started getting emails from people who had participated. The first one is still one of my favorites. "Add it to your collection, 'My best friend is the one I can call at four o'clock in the morning.'" Marlene Dietrich said.

This email was sent by a sexy European guy -- TED curator Chris Anderson.

(Laughter) It was written on a coffee cup or something. This man is an infectious source of valuable ideas, and I infected him.

In less than a week, I was proven to be contagious when a Hallmark employee scanned and sent me a greeting card with the same quote.

As a bonus, he also told me another version that the company made.

"Just knowing that you can call me at 4 o'clock in the morning, I don't have to call you anymore." Putting the two together, you get something like this: "Hallmark, to the person who's so important to me that I send my feelings twice in slightly different words."

I wouldn't be surprised if TED attendees read The New Yorker.

As soon as it was issued, they sent me a lot

"4 a.m. — I could have slept better if I had bought it."

But I was surprised that TED attendees had seen "Rugrats."

a few people sent me this

(Diddy Pickles) It's four o'clock in the morning

Why are you making chocolate pudding?

(Stu Pickles) 'Cause life just doesn't turn out the way you want it to

(Laughter) And then, one of the TED attendees was angry that I had overlooked a scene that could be considered a classic.

(Roy Neary) Get up! Seriously (Ronnie Neary) Accident?

(Roy) No, it wasn't an accident. You wanted to get out of the house anyway, right?

(Ronnie) It's four o'clock in the morning.

This is "Close Encounters of the Third Kind," and the protagonist is thrilled, because it's exactly 4:00 a.m. when the aliens show up -- which makes it all the more believable.

all are great examples

But it never becomes clear why I recognized that poem.

But every example follows a pattern.

Because all dramatic events are supposed to have happened because of this hour.

It's probably a cliché that has never been classified before.

Maybe I was on the cusp of a new lore.

When things get interesting, they become interesting.

That year, TED.com started, and my past talks were published, and I started getting quotes about 4:00 in the morning from all corners of the globe.

Most of them I wouldn't have found if I had searched alone, and I wouldn't have searched for them.

I don't know anyone with juvenile diabetes.

You wouldn't notice a booklet like this "Cheese Sandwich at 4 in the Morning"

(Laughter) I don't even subscribe to Knitting Today magazine. That sounds interesting. (Laughter) Look at the clock.

Here's a gang sign that a college student told me about four o'clock in the morning.

People who sent magazine ads

Some people took pictures at the supermarket

We also collected a lot of graphic novels and comics.

There are many high-level works such as "Sandman" and "Watchmen" ―

There's even an adorable scene from "Calvin & Hobbes."

The oldest post is from the Stone Age comics.

Please look

(Wilma Flintstone) How early in the morning?

(Fred Flintstone) Like four o'clock in the morning

Going backwards in time, here's a quote from the 31st century.

Thousand years from now, we're still doing the same thing

(Announcer) The time is 4:00 a.m.

(Laughter) It's varied.

I've got a ton of songs, TV shows, and movies, from crap to classic, and I can create a four-hour playlist.

But if you're limited to modern movie actors, you can fit it in the length of a commercial.

see some

(Movie scene, "It's four o'clock in the morning.") (Laughter) It kind of became a hobby, but I'm not sure if I really wanted to, and it's a crowdsourced hobby.

On the other hand, I also wondered what anyone else would think: could we do the same thing at another time?

But at "four o'clock in the evening," you wouldn't be able to get this kind of footage.

I was even more interested

I did a little research

If you're going to blame this on prejudice, there's a lot of evidence that's the source of that prejudice.

Literature is the most obvious

For Shakespeare, 3 o'clock in the morning is twice -

Appears once at 5 o'clock in the morning

4 o'clock in the morning appears seven times, all of which are terrifying scenes.

In "Measure for Measure," it's time for the executioner to appear.

In Tolstoy's War and Peace, Napoleon suffers from insomnia at 4am just before the battle.

Whether it's Charlotte Brontë's "Jane Eyre" or Emily Brontë's "Wuthering Heights," four o'clock in the morning is an important moment.

In "Lolita" it's an eerie four o'clock in the morning —

In "Huckleberry Finn," there's a heavy accent at 4 in the morning.

Some people read "The Invisible Man" by H.G. Wells

Another sent me "The Invisible Man" by Ralph Ellison.

"The Great Gatsby" spends the last morning of his life at 4:00 a.m. waiting for his missing lover, and perhaps the most famous awakening in literature is Kafka's "The Metamorphosis."

In the first paragraph, the main character wakes up to find himself in a giant cockroach, but even without that, we know something is going on with this guy.

Because the alarm clock is set for 4:00 in the morning.

Who would do that?

These are the people

(Music) (Montage of alarm clocks going off at 4am) (Newscaster) It's just 4am, time for the morning news

There shouldn't be any news

Because everyone is still sleeping comfortably in their beds

That's right

Lucy from "Peanuts", "The Legend of Love and Hate", Rocky on the first day of training, Nelson Mandela on the first day of school, Bart Simpson, along with those cockroaches, have provided so many great examples that I've created a new genre in my huge database: "The Awakener."

Imagine if a family member or friend told you that you collect stuffed polar bears and sent them to you.

Even if you're not serious, if you get a lot of polar bears, you've got a great collection.

I accepted everything when it happened

Like a curator, researching facts, downloading, illegally taking screenshots.

I started archiving

A mere hobby turned into a habit, and that habit has made home delivery DVD rental carts perhaps the most diverse in the world.

I've seen movies like this side by side, "Guys and Women", "Last Tango in Paris", "Greg's Bad Diary", "The Porn Star: The Legend of Ron Jamie"...

Why "The Legend of Ron Jamie"?

Because someone told me that there is such a scene

(Ron Jermie) I was born in Flushing, Queens It's 4 o'clock in the morning on March 12, 1953

(Laughter) (Applause) Not only does it make sense, but it also answers the question, "What do Ron Jamie and Beauvoir have in common?"

The first sentence of Beauvoir's autobiography is, "I was born at four o'clock in the morning." I learned this in an email, and it's taken my collection to the next level.

But despite our differences, we were connected by this one thing. I don't know if this is trivia, or knowledge, or just buoyant expertise, but I figured out a cool way to wrap it all up.

So in October of last year, in the tradition of academics, I put the entire collection online: "Museum at 4:00 in the morning."

Click the red reload button

You can see it randomly from hundreds of citations.

This is a striking poem, "Forgetting," by Billy Collins.

(Billy Collins) No wonder you wake up in the middle of the night and open a war book and look for the date of a famous battle.

No wonder the moon in my window looks like it's slipped out of the love poems I used to say in my mind

CA: I'm happy with how this project started.

Watch Bollywood actors sing on a DVD playing in a cafe

A young man on the other side of the world made a video on Instagram and sent it to me, a total stranger.

But within a week, I had a little bit of luck.

I received a tweet that touched my heart

it was a short tweet

"It's like an old mixtape."

The name was a further twist on the nickname

But the moment I saw the initials and the profile picture, I could feel the identity of the sender, and she said, the mixtape.

(music) L.D. was all about college romance

It was the early 90's and I was an undergraduate.

She is a graduate student in the Faculty of Library Science

I'm not the type to suddenly get sexy when I take my glasses off and let my hair down

She was sexy from the beginning, she was incredibly beautiful, and we had a "December-May" relationship.

But I kept the mixtape she gave me.

I keep it in a box with my notes and postcards, not just from L.D., but from my life, I've collected it for decades.

I would probably hide it from my girlfriend, but if I had a wife, I would probably watch it with her.

Instead, L.D. left us a hint by writing down symbols and page numbers for the Library of Congress classification table.

I got this tape, put it in my cassette player, took it to her library, the university library, and found 14 books on the shelf.

I took all the books to my favorite corner table and read the poems that corresponded to the songs, like wine with a meal or a vintage cobalt blue cotton dress with saddle shoes...

I tried again last October

I sat down, put my new earphones on my old Walkman, and realized that I was too extravagant to take it for granted.

I felt envious of myself at the time

"PG" is a symbol in Slavic literature

7000s are Polish Literature

"Z9A24" is a collection of 70 poems.

Page 31 was by Wislawa Szymborska, and the song was "The City of Peace" by Paul Simon.

(Music by Paul Simon, "The City of Peace") (Paul Simon) ♪ At four o'clock in the morning ♪ ♪ I woke up from my dream ♪ Thank you very much (Applause)

Today's computer algorithms are doing an amazing job, they have human-like intelligence, and they can process huge amounts of data with great precision.

This computer intelligence is often called "AI" or "artificial intelligence."

AI is poised to have an amazing impact on people's lives in the future.

But we still face many challenges in detecting and diagnosing life-threatening diseases such as infectious diseases and cancer.

Thousands of patients die each year from liver and oral cancer.

The best way to save these patients is early detection and diagnosis of cancer.

How is disease detected today? Can AI be used?

Unfortunately, when a patient is suspected of having one of these diseases, the first thing specialists recommend is the use of very expensive medical imaging techniques such as fluorescence imaging, CT and MRI.

Once the images are collected, another specialist examines the images and gives the diagnosis to the patient.

As you can see, this process is extremely resource intensive, two specialists, expensive medical imaging technology, and impractical in the developing world.

In fact, it's the same in many developed countries.

So can we use AI to solve this problem?

Today, if I were to try to solve this problem using conventional AI mechanisms, I would first need 10,000 -- and again, 10,000 -- very expensive medical images.

Then I go to a specialist and have these images analyzed.

And with these two pieces of information, we can train a standard deep neural network or deep learning network to diagnose a patient.

Like the first approach, the traditional approach with AI runs into the same problems.

Huge amount of data, specialists Medical imaging technology for specialists

So, is it possible to build AI that is more disseminated, more effective, more valuable, and that solves the key challenges we face today?

That's exactly what my group is working on at the MIT Media Lab.

We've developed some novel AI mechanisms to solve some of the most important challenges facing medical imaging and clinical trials today.

The example I gave you today had two goals.

Our first goal was to reduce the number of images needed to train the AI's algorithms.

Our second goal was more ambitious, and we wanted to reduce the use of expensive medical imaging technology when screening patients.

how did we work

For the first goal, instead of starting with tens of thousands of expensive medical images like traditional AI, we decided to start with one medical image.

My team found a clever way to extract billions of packets of information from this image.

These information packets contain colors, pixels, geometries -- and renderings of lesions in medical images.

In a way, by turning a single image into billions of training data, we are able to significantly reduce the amount of data needed for training.

The second goal, to reduce the use of expensive medical imaging tests for screening purposes, was to start with standard white-light photographs taken with DSLRs and cell phones for patients.

Remember those billions of information packets?

So I superimposed that information from the medical image on top of this image to create what is called a composite photograph.

Quite surprisingly, just 50 were enough. Again, just 50 composites were enough to effectively train the algorithm.

Taken together, our approach is that instead of using 10,000 very expensive medical images, we're able to train an AI algorithm in a revolutionary way. It only takes 50 standard high-resolution photos taken with a DSLR camera or a cell phone to make a diagnosis.

More importantly, our algorithms can, in the future and still, take advantage of very simple white-light photographs of the patient, rather than expensive medical imaging technology.

I believe we are entering an era where AI will have a tremendous impact on our future.

When we think about conventional AI, which has a lot of data but is inconvenient to operate, we should continue to think about novel AI mechanisms that can take advantage of small amounts of data and solve the most important problems we face today, especially in the medical field.

thank you very much

(applause)

As a scientist and as a person, I want to remain sensitive to the wonders of the world.

I thought about what Jason Webley said last night, "becoming part of the mystery."

In my career as a biologist, I've been fortunate enough to be deeply involved in the biology of one very mysterious creature that lives on the same planet as us: fireflies.

For many of you here, fireflies may bring back some wonderful memories -- childhood memories, summer memories, and even other TED talks.

Maybe it's a memory like this

My fascination with the world of fireflies dates back to my graduate school days.

One night, I was sitting in my backyard in North Carolina, and all of a sudden, there was a silent light all around me, and I wondered, how does this creature emit light? what does that mean?

Are you talking to each other?

What happens after the light goes out?

As I explored this night world, I was fortunate enough to find some answers to questions like these.

If you've seen fireflies or heard about fireflies, you know they have the magical power to transform everyday landscapes into a heavenly, otherworldly world. That's what happens on Earth. I've seen this blue ghost firefly on the slopes of the Smoky Mountains, giving off a strange glow, like a waterfall of living light. Also, in Malaysia, I saw flowers of light blooming in the mangrove trees at night, and even though there were no flowers, the fireflies (glitter, glitter) would form bells and flash together in spectacular harmony.

Illuminated landscapes like this still make me wonder and keep me connected to the magic of the natural world.

It's really amazing that it's produced by such a small insect.

Fireflies are fascinating to me.

is charismatic

It's been celebrated in the world of art and poetry for centuries.

In my travels around the world, I've met many thinkers who say that God put fireflies on Earth for humans to enjoy.

Other living creatures will also enjoy the glow of fireflies.

This graceful insect is truly mystical, because it's an aesthetic reflection of evolutionary improvisation.

They were shaped by two powerful evolutionary forces: natural selection, the race for survival, and sexual selection, the race for reproductive opportunities.

As a firefly devotee, the last 20 years have been very exciting.

Together with my Tufts students and other research colleagues, we discovered a lot about fireflies: their courtship behavior, their sexual behavior, their betrayal, their killing of their mates.

Today I would like to share with you some of the results of our research in this hidden world.

Fireflies belong to a very beautiful and diverse group of insects called beetles.

There are more than 2,000 firefly species in the world, and they have evolved a wide variety of courtship patterns, or methods of attracting the opposite sex.

Primordial fireflies, born about 150 million years ago, must have looked like this.

It flew in daylight and didn't fluoresce.

Instead, the male picked up the female's scent with his excellent antennae.

And in some fireflies, only the females fluoresce.

Attractively round to females, but without wings, they climb trees every night and glow brightly for hours to attract males that can fly but do not glow.

In other fireflies, both males and females look for the opposite sex by flashing brightly at short intervals.

There are more than 100 species of fireflies here in North America, and they have the amazing ability to release energy from their bodies in the form of light.

How?

As magical as it is, bioluminescence is produced by a cleverly integrated chemical reaction inside the firefly's luminophore.

The enzyme responsible for doing this is called luciferase, and during evolution it evolved to wrap around a smaller molecule, luciferin, with tiny arms, and in doing so, it becomes an excited state and actually emits light.

It's wonderful

So how did this bright light benefit the original firefly?

To answer this question, we have to go all the way back to the pictures of babies in our family albums.

Fireflies completely remodel their bodies as they grow.

Spends most of its life - up to 2 years as a larva

That period is just like my teenage years, but it's all about eating and growing.

firefly light begins in this childhood

All the larvae can fluoresce, even in hotels that don't emit light as adults.

But what is it that makes you look so conspicuous?

In fact, it's this foul-tasting chemical that helps the larvae survive their long childhoods.

i think it has evolved

It took millions of years for this brilliant light to evolve into an excellent means of communication, and it's likely that this light not only keeps predators away, but also attracts the opposite sex.

Guided by the act of selection by the opposite sex, like this proud male, the adult firefly would have evolved like a lantern glowing in the dark, taking the relationship with the opposite sex to a whole new level.

These adult worms can only survive for a few weeks, and they just want to mate, which means they pass their genes on to the next generation.

If you try to track this male down the field, you'll find yourself in crowds of hundreds of males and sending out signals to mate.

How wonderful it would be to think that the glow of fireflies that we celebrate here is actually the silent love song of male fireflies that are played out all over the world.

I'm dancing in the sky and using all my strength to emit light

how romantic

By the way, where are the females?

You see, down there, it seems like he's wandering around thinking about who he should be.

There are many males to choose from, but females are very picky.

When a female sees the light emitted by a very attractive male, she turns her pigmented part toward the male and flashes back.

This is the sign that says, "Come here."

Then the male approaches and emits light again

If the male still likes it, the two start a conversation.

This creature speaks of love in the language of light.

So how do females measure a male's sexual attractiveness?

We decided to statistically look at female firefly preferences.

We tested the females with a flashing LED, and they preferred the males, which lasted longer.

(Laughter) (Applause) You might be wondering why males like this are so sexually attractive.

Let's see what happens when the light goes out

The first thing we found is that males and females first bond and spend the night like this, and what's going on inside their bodies.

During mating, the male not only devoted himself to the delivery of semen to the female, but also infused it with a nutrient-rich fluid that could be considered a matrimonial gift.

If you zoom in further and observe the interior of a mating pair,

You can see this gift -- shown here in red -- and see that it's transferred from male to female.

What's important about this gift is that it's rich in protein, which the female supplies to her eggs.

That's why females look closely at this gift when choosing potential male grooms.

It turns out that females determine which male's gift is the greatest by looking at the male's flashing lights, because the longer the glow, the more eggs they can produce, and ultimately, the more offspring they produce.

It's not just sweet or brilliance

Firefly romances come with risks

Most adult fireflies are never eaten because, like their larvae, they create toxins to keep birds and other predators at bay. But in the course of evolution, firefly species have lost their metabolic capacity to produce toxins that protect them.

Discovered by fellow researcher Tom Eisner, this evolutionary flaw, in turn, has turned the firefly into a bright night light with dangerous intentions.

The females, which another research colleague of mine, Jim Lloyd, calls "the femme fatale," target a different kind of male firefly.

You begin your hunt as a predator, and the female in the lower left sits quietly, listening for a targeted courtship of a firefly, and this is what happens.

First of all, the male firefly that will be the prey flashes the light "Do you like me?"

And the female of the same species responds, "Maybe."

Male flashes light again

But this time the predator firefly makes a deceptive response, cleverly copying the response of the other female.

I'm not looking for love, I'm looking for toxins

If the female predator is attractive, she can lure the male out and catch him when he gets close, not just a quick snack.

Over the next few hours, the female predator sucks the blood of the male, leaving behind a bloody wreckage.

Since they cannot produce their own toxins, they resort to other means of sucking firefly blood to obtain these protective chemicals.

A blood-sucking firefly created by natural selection A blood-sucking firefly created by natural selection

We still have a lot to learn about fireflies, but a lot will remain unexplained because fireflies are declining in numbers around the world.

Habitat shrinkage is the biggest cause

Wildernesses, forests, mangroves and meadows everywhere that fireflies can live are being overtaken by development and urban sprawl.

There's also another problem: we've conquered the darkness, but in the process, too much light leaks into the darkness, threatening the lives of other organisms. Fireflies are particularly sensitive to light pollution because it obscures light signals as a means of finding mates.

Are fireflies really needed?

After all, fireflies are only a fraction of the species diversity on Earth.

But with each passing moment, the seeds are lost, just like all the candles in the room, one by one, going out.

You may not realize it when the first few lights go out, but you may not realize it when the first few lights go out, but eventually you'll be left alone in the dark.

I hope that we can find a way to keep this bright light shining as we shape the future of our planet together.

thank you very much

(applause)

"Pheromone" is a very powerful word.

It evokes sex, spontaneity, out of control, and as you can see, it's a very important word.

But the word was born in 1959, so it's only 50 years old.

I think you've tried, if you search the web for that word, I think you've already tried, if you search the web for that term, you'll get tens of thousands of hits, and almost all of those sites will try to sell you something you really want for $10 or so.

Well, it's a very attractive idea, and the "molecules" they talk about on those sites sounds really scientific.

They have different names

It's like androstenol or androstenone -- or androstedinone.

It just keeps getting better and better, and when you combine it with your lab coat, I bet you're imagining some incredible science behind it.

But sadly, these are bluff claims backed up by dodgy science.

The problem is that many good scientists work on what they consider to be human pheromones, and on this basis they publish them in prestigious journals, but despite a lot of very sophisticated experiments, there is no real science at all.

We are mammals and we have many scents.

No one has done any research to systematically identify which molecules really are pheromones.

They pick out just a few examples on which to base these experiments, but there's absolutely no solid evidence for it.

But that doesn't mean smell is trivial.

In fact, there are genuine smell fetishes, and Napoleon is one of them.

And as you all know, while on the campaign trail for the war, he wrote to his lover, Empress Josephine, "Don't wash me, I'm going home."

(Laughter) Yes, Napoleon didn't want to lose her sweet scent before he came home.

But at the same time, we spend as much money getting the smell out of our bodies as we wear perfume, and perfume is a multi-billion industry.

So what I'm going to do is talk about what pheromones really are, why we expect humans to have pheromones, and some theories about pheromones.

As the ancient Greeks knew, dogs send invisible signals to each other.

A primed female dog sends an invisible signal for miles to the male dog, and it's not a sound, it's an odor.

You can take the smell from a female dog and she will follow the smelly cloth.

But while this effect was understood by everyone, the molecule could not be identified.

I couldn't prove it was a chemical.

The reason, of course, is that each of these animals emits a small amount of scent, and in the case of dogs, male dogs can smell it, but we can't.

In 1959, a team of German researchers spent 20 years identifying these molecules and finally discovered and identified the first pheromone, the sex pheromone of silkworms.

This was a brilliant choice by Adolphe Boutentand and his team, because he used 500,000 silkworms to collect enough material for chemical analysis.

Not only that, but he also created a model for pheromone analysis methods.

He basically worked systematically, and he discovered molecules that stimulated only males.He discovered molecules that stimulated only males.

analyzed very carefully

Synthesize that molecule, test it against a male, check the response, and indeed the molecule works, check the response, and indeed show the molecule works

i.e. full verification

No such study has been done in humans, it's not systematic, it's not empirical.

A new concept needed a new word, and that was the word "pheromone," which was basically a stimulant that was transmitted between individuals.

The same was true for underwater creatures like goldfish and lobsters.

And most mammals you can imagine, and even many insects, have specific pheromones.

So we know that pheromones exist throughout the animal kingdom.

What about humans?

First of all, of course we are mammals, first of all, of course we are mammals, and mammals smell strongly.

We and like all dog owners say dogs smell We also like every dog ​​owner say dogs smell

But the reason we think humans will have pheromones is the changes that happen as we grow, the reason we think we will have pheromones is the changes that happen as we grow.

An adolescent's room smells very different than a small child's room smells very different from a small child's room.

What has changed? Of course I'm old

There's a change in pubic hair and armpit hair, and it's in these areas that new glands start to secrete, and that's what causes the smell to change.

If we were any other mammal, or any other animal, we would have said, "It must be pheromone-related," and we would have begun to study it rigorously.

But there are some problems, and I think this is why we haven't been able to search for human pheromones very effectively.

It's a lot of problems.

The first question, perhaps surprising, is

it's all about culture

Moths don't remember what smells good, but humans do, and until the age of four or so, any smell, no matter how stinky, is simply interesting.

Sometimes what parents do is keep their kids out of their poop, because it smells good.

But gradually, we learn what's bad, and one of them is bad and good at the same time.

Now the cheese behind me is a British or British delicacy.

It's a ripe blue stilton cheese

It would be incomprehensible for people from other countries to like such things.

Every culture has its own special foods and national delicacies.

If you're from Iceland, your national delicacy is rotten shark.

Now, all of these things have tastes, but they all have pretty much the same gustatory signature.

It's the same system

The second is about the sense of smell.

Because each of us smells, we each have our own "smell world," and each of them is completely different.

Now, smell is the most difficult sense to decipher, and smell is the most difficult sense to decipher, and it was only in 2004 that Richard Axel and Linda Buck won the Nobel Prize for discovering how smell works.

It's very difficult, but essentially, nerves from the brain go through the nose and are exposed to the atmosphere in the nasal cavity. These nerves are receptors, and when odor molecules interact with these receptors and bind to them, they send signals to the nerves back to the brain.

We don't have just one type of receptor.

If you're a human, you have 400 different kinds of receptors, and your brain senses what you're smelling. And by connecting the triggering receptors to the neurons, you combinatorically send messages to the brain.

But it's a little more complicated, because each of the 400 [receptors] come in different combinations, and depending on the combination you have, it's the difference between when you smell that example herb, coriander, or cilantro, and you think it tastes good, it smells good, it's soapy.

So our unique "smell world" complicates everything when it comes to studying odors.

Now, back to the subject of armpits, I can say that I have a particularly good thing about that.

I'm not going to show you that, but this is where most people have been looking for pheromones.

And there's a good reason: armpits are a hallmark of great apes.

Other primates have scent glands in other body parts.

Great apes have armpits full of secretory glands that constantly produce a multitude of molecules -- odors.

When molecules are secreted from glands When molecules are secreted from glands

It's completely odorless and odorless, but it's the great bacteria that thrive in the rainforest-like hairs that apparently create the familiar scent of love.

By the way, if you want to reduce odor, shaving your armpits, which are breeding grounds for bacteria, is a very effective method and will keep odor at bay for a very long time.

Now, I'm focusing on the armpits, and I think that's partly because it's the least embarrassing place to ask for a sample.

There's another reason why you don't want a universal sex pheromone, and there's another reason you don't want a universal sex pheromone.

They are Chinese, Japanese, Koreans and other North Asians.

They have a taste for bacteria and don't secrete any of the odorless precursors that give rise to their odor, although they always associate their unique odor with their armpits.

That means it doesn't apply to 20% of the human race.

So what exactly should you do if you're looking for human pheromones?

I believe in the existence of pheromones

Humans are also mammals, so they probably have pheromones, just like other mammals.

But what you have to do is go back to the beginning and basically look through the whole body. Go back to the beginning and basically look through the whole body.

Without shame, we need to seek and go where no one has gone before.

It's going to be difficult and confusing

We also need to go back to the ideas Bootenant used when he studied silkworms.

We need to go back and systematically look at all the molecules that are being excreted to find out the main factor.

It's not enough to randomly select a few and say "This is it!" It's not enough to randomly select a few and say "This is it!"

We need to show the effect of the main factors in empirical experiments.

There's a French research team that really impressed me.

I was very impressed by a French research team that earned their fame by identifying mammary gland pheromones in rabbits.

Now they're looking at human babies and mothers Now they're looking at human babies and mothers

This is a baby sucking its mother's breast

Her nipples are completely hidden by the baby's head, but you'll notice the white drop-shaped thing pointed to by the arrow, which is secretion from the areolar glands.

Both men and women have it. The areola is the ridge around the nipple, and if you're a breastfeeding woman, it starts to secrete.

it's a very interesting secretion

What Benoît Charl and his team developed was a simple test to see what the effects of this secretion were, an effective and simple bioassay.

This is a sleeping baby, even if you hold a clean glass rod under your nose.

Baby stays asleep showing no interest

But as long as it's a mother that has fluid coming from the areolar glands -- not her own mother -- not her own mother -- any fluid from any mother will have a completely different reaction if you put it close to the baby's nose.

Having found a favorite food, he opens his mouth happily, sticks out his tongue, and begins to suck.

It can be from any mother, so it's really a pheromone.

not individual recognition

from any mother

So what's more important than just being interesting?

That's because different women have different numbers of areolar glands, and there's a correlation between which babies start suckling easily and the number of mammary glands a woman has.

The more maternal secretions, the quicker the baby seems to start sucking.

If you're a mammal, the most dangerous time in your life is the first few hours after birth.

You must get your first milk or you won't survive

will die

Many babies find it difficult to get to their first meal if they don't get the right stimuli. They know that it's difficult to get to their first meal. The French team will be skeptical, but if we can identify what that molecule is and if we can synthesize it, premature infants will be more likely to initiate breastfeeding, and if we can synthesize it, premature infants will be more likely to initiate breastfeeding, and all babies will have a better chance of surviving. And every baby has a better chance of surviving.

So what I'm trying to say is that this is one example of how systematic, really scientific means have actually brought you to an understanding of real pheromones.

Any kind of medical involvement is also possible

There are likely many things that humans do with pheromones that we simply don't know yet.There are likely many things humans do with pheromones.

Remember Pheromones Are Not Just About Sex Remember Pheromones Are Not Only About Sex

It affects all kinds of behaviors in mammalian life.

So let's continue to do more research

there's a lot to discover

thank you very much

(applause)

Why would a marine biologist from Oceana be here to talk about world hunger?

The reason I'm here today is because protecting our oceans is more than an environmental issue.

Because it's not just about what we do, it's about creating jobs for the fisheries and protecting the fisheries.

Going beyond the pursuit of economic behavior

By protecting the oceans, we can get the world's food

I will explain why

As you know, there are over a billion hungry people on this planet.

When the world's population hits 9 to 10 billion people in the middle of this century, things will get even worse, and the pressure on food resources will be even more severe than it is today.

It's very worrisome, and it's even worse when you think about food today.

Arable land per capita is already declining in both developed and developing countries.

Climate change is also increasing, with precipitation patterns changing, with areas in orange becoming drier and areas in blue getting more rain. Some areas of the Middle East and Central Europe are experiencing food shortages, while others are experiencing more flooding.

It's going to be harder to use land to solve the food problem.

So we have to keep the ocean as rich as possible so that we can supply as much food as possible.

The ocean has always been our food source.

As far back as possible, more food was being harvested from the sea.

But it continued to rise until about 1980, when it started to decline.

Like the story of peak oil

maybe fish peak

I hope I'm wrong, but I'll explain later

As you can see, global fish catches have declined by about 18 percent since 1980.

this is a big problem

the red curve keeps going down

But I know how to restore this, and that's what I'm going to talk about today.

We know how to turn this curve upwards.

Fisheries should not have peaked

With a few simple efforts in the right places, we can bring back our fisheries and feed our people.

First we need to know where the fish are.

Fortunately, most of the fish live in coastal waters near land, coastal waters, and coastal waters are governed by the jurisdiction of each country, so coastal fisheries can be controlled.

Coastal states' rights often extend up to 200 nautical miles, called exclusive economic zones, and that's a good thing, because fisheries in these areas can be managed, and on the high seas, as shown in the darker shades on the map, on the high seas, it's much more difficult to manage, because it has to be done internationally.

We have to create an international treaty, and anyone who knows about climate change agreements knows how long, frustrating, and laborious process it is.

Being able to manage it at the national level is a very good thing.

How much fish are there in coastal waters compared to the high seas?

As you can see here, there are seven times more fish in coastal waters than in the high seas, so it's best to focus on coastal waters, because you get better results.

Just by focusing on coastal areas, we can get back a lot of fish.

How many countries need this effort?

There are about 80 coastal countries.

Do all those countries have to improve their fisheries management?

I've thought of a few countries that should be focused on, and fortunately the EU countries are governed by a common fisheries policy.

If fisheries management in the EU is done well, if the other nine countries manage well, how much of the fish will be covered?

In fact, the EU and nine countries account for about two-thirds of the world's fish catch.

If you include the EU plus 24 other countries, that's 90 percent, almost all of the world's fish catch.

To bring back the world's fish catch, we have to reach out to specific countries.

what to do in such a country

We have to allocate or regulate our landings. We have to reduce bycatch. It's very wasteful to catch and kill other fish that you don't want.

If you do these three things, the fish will revive.

if you know why

because that's what's happening all over the place

As you can see in this slide, the number of herring in Norway has plummeted since the 1950s.

What would have happened if Norway had put a limit quota on the fishery after it had plummeted?

Landing volume has recovered

Another example is Arctic cod, also in Norway.

Similarly, as fish catches plummeted,

Added restrictions on disposal

Discarding bycatch is wasted fish that weren't intended.

When we put a limit on discards, catches rebounded.

Norway is not alone

Seen many times in countries around the world

By adopting aggressive sustainable fisheries management policies in these countries, fisheries that were thought to be in a state of devastation are beginning to come back.

this is a very promising result

against global fisheries

What does that mean? It means that we can restore our declining seafood catches and increase them to 100 million tonnes a year.

So the fishing industry hasn't peaked yet.

We have the potential to not only bring back the fish, but to bring in more fish to feed more people than we have today.

So how much is it? Right now, the world's fish catch feeds 450 million people. It's on the decline, but if we don't do anything, it's going to continue to decline. If we have 10 to 25 countries that manage their fisheries in the way I've described, we could increase that number and feed 700 million people with healthy fish.

This is clearly something that should be done, because the food problem is something that should be solved, and it's also very cost-effective.

In fact, seafood is the most cost-effective protein source on the planet.

If you look at the amount of protein you get for every dollar you put in, fish is more economically viable than any other animal protein.

It doesn't need a large piece of land, which is now itself in short supply.

You don't need to use a lot of fresh water

They need far less fresh water than livestock, for example, because livestock need water to grow their feed.

Also the amount of carbon dioxide produced

much less, of course it takes a little more fuel to go fishing

It emits carbon dioxide, which is much smaller than the carbon footprint of agriculture, which means less pollution.

It's already a big part of your dinner table, but you can make more of it, and that's good, and it's good for your health.

Reduces risk of cancer, heart disease and obesity

It's a concept started by our CEO, Andy Sharpless, who often says, "Fish is the perfect source of protein."

Andy also talks a lot about how our marine conservation efforts have evolved into terrestrial conservation efforts. On land, there's a battle between biodiversity conservation and food production.

There is always a conflict between clearing forests for biodiversity and creating fields of corn for people to eat.

It always requires difficult decisions between two important issues: biodiversity conservation and food production.

But there is no such battle in the sea

In the ocean, biodiversity and bountiful harvests do not compete.

both stand side by side

When you take actions that create biodiversity, you also increase your harvest, and the important thing is that you can provide food for humans.

But there are also catches

Didn't you understand? (Laughter) It's illegal.

Illegal fishing undermines the fisheries management we've been talking about.

Fishing with prohibited gear, fishing with prohibited gear, fishing in prohibited areas, and fishing in violation of size and type limits are illegal.

Illegal fishing deceives consumers and deceives honest fishermen and must be stopped.

Food fraud is the way illegal fish enter the market.

you've heard

It's labeled with a different fish.

last time i ate fish

What did you eat

was it really the fish

Of the 1,300 species of fish that were sampled and inspected, one-third of them were different from what was labeled.

Even if it was labeled as snapper, 90% of it was something else.

59 percent of tuna were mislabeled

Of the 120 samples of sea bream, only 7 were real sea bream.

The distribution channels for marine products are complex, and unless traceability is introduced, there is room for mislabeling at any step along the way.

Traceability will allow the seafood industry to track seafood from ship to plate, allowing consumers to ascertain where the seafood came from.

this is extremely important

We are lobbying Congress to enact a SAFE Seafood Act, and today we are delighted to announce to Congress the petition of 450 chefs to enact a SAFE Seafood Act.

There are a number of famous chefs on the list, including Anthony Bourdain and Mario Batali Burton Seaver who signed up because they believed they had a right to know what they were eating.

(Applause) And fishermen are on board, so we're going to have the support we need to make this bill a reality. We're at a critical moment, because this is the way to stop mislabeling, the way to curb illegal fishing, and the way quotas, habitat protection, and bycatch reduction are needed to work.

It is possible to operate a sustainable fishery

It's possible to provide healthy diets to hundreds of millions of people in a landless, waterless, low carbon footprint and economical way.

By protecting our oceans, we can feed the world, so we have to start now.

(Applause) Thank you (Applause)

About 30 years ago, when I was working in the medical oncology department at Children's Hospital in Philadelphia, a father and his son came to my office.

That moment changed my life

That experience pushed me to co-lead the team that discovered the first cancer susceptibility gene, and in the decades since, our field has literally undergone a seismic shift, revealing what genetic mutations are behind various diseases.

In fact, the molecular basis that determines thousands of human traits, and every day thousands of people are getting new information about their risk of various diseases.

But at the same time, if you ask me, "Did that make the way we develop drugs more efficient?"

the answer is no

The breakdown of drug development costs doesn't include costs for those things.

So it's as if we've got the power to diagnose, but we don't have the power to fully cure.

And there are two trivial reasons for this situation.

The first reason is that we are still in the early days of this field.

I'm just beginning to know the words, the pieces of information, the letters and sequences of genetic information.

I don't even know how to read the sentence

I can't even understand the context of the story.

Another reason is that most of the changes that happen to us are the loss of bodily functions, and it's very difficult to restore these functions with drugs.

But today, I want to take a step back and ask a more fundamental question: What if we're putting this in the wrong context?

We've studied many patients, and we've come up with a long list of mutated genes.

But maybe what we're trying to do is prevent disease, and what we really need to do is study people who don't actually get sick.

Maybe it's about doing more research into why healthy people are healthy.

Most people don't necessarily have one particular gene or risk factor.

they don't offer solutions

Those people are at risk of contracting the disease in the future and will eventually develop symptoms.

It is not those people who are the target

What we're looking for are those very few people who have risk factors that would otherwise make them sick, but who are protected from developing disease by something that has a hidden protective function in them.

It's easy to imagine that in order to do that kind of research, you'd need to study a large number of people.

We need large-scale clinical studies, and I realized that one way, and one way, is to look at adults over the age of 40 -- all of whom were healthy as children.

Some of them may have family members with childhood illnesses, but that's not always the case.

And then screening will identify people who carry genes for childhood diseases.

Now, some of you say, "No, wait a minute.

Where is the evidence that it is possible? Some people are wondering

Let me give you two examples

One example is San Francisco.

Do you know people who had very high levels of the HIV virus in the 1980s and 1990s who had very high levels of the HIV virus?

Eventually they got AIDS

But a small minority of them have very high levels of the HIV virus,

did not get AIDS

And brilliant clinical researchers figured out that they had a genetic mutation.

Note that they were born with a protective mutation that protected them from AIDS.

As some of you may know, a series of treatments have been developed based on this.

The second example is more recent. There was a study elegantly designed by Helen Hobbs that said, "Look at people who have very high lipid levels, and find people who have high lipid levels and who don't have heart disease."

She, too, has found that some people have very high lipid levels, but also have genetic mutations that have protected them from birth.

Our project was called "The Resilience Project: In Search of Unknown Heroes," and the reason for this was our desire to identify rare individuals with hidden protective factors.

In a way, think of this as an alliance of codebreakers. What we're trying to create is the Resilience Codebreaker Alliance.

Once we realized that we had to do this systematically, we considered all childhood genetic disorders.

So I started by making a list of all of them, and then picking out the most severe diseases that the parents knew their children, and people around them, would know they had.

So where should we look?

You can see neighborhoods and locals, which is reasonable.

But I started to think, maybe we should look around the world.

Not only around here, but perhaps we should also look at remote areas where characteristic genes grow. Maybe we can find environmental factors that protect people.

Target a million people

I think now is a really good time to do this because the cost of this kind of analysis and this kind of data collection has dropped significantly over the last few years, to the point where the cost of data collection and analysis is cheaper than the cost of collecting and processing samples.

Another reason is that in the last five years, new tools have emerged in the fields of network biology and systems biology that may be used to reveal the secrets of uniquely healthy people.

As I walked around telling this story to researchers and research institutions, I started telling this story to researchers and research institutions, and something started to happen, something started to happen.

They said, "This is interesting.

I would be happy to participate in your research."

I started saying

They were like, "What's going on with the material transfer agreement?"

“What will happen to my description as an author?”

I didn't say, "Do I own this data?"

And they basically said, "Let's get an open, crowdsourced team to crack the code."

Six months ago we identified a screening key for decryption.

Eric Schatt, a brilliant scientist at Icahn-Mount Sinai School of Medicine in New York, my co-director, and his team identified the key to breaking the code, and we started looking for samples, because we realized that we could work out feasibility from some of the existing samples.

Existence may be inferred from 2-3% of the total number of projects targeted

And we enlisted the help of -- Haakon of the Children's Hospital of Philadelphia,

Finnish Leif

I talked to Ann Wojcicki of 23andMe and Wang Jun of BGI about this, and it turned out really well.

It's like, "We have a sample, but we've already analyzed it. Let's take that anonymized sample and use that anonymized sample to see if we can find what we're looking for."

We thought it would be from 20,000 to 30,000 samples, but last month we finished analyzing 500,000 samples.

You may be thinking, "So, did we find an unknown hero?"

I don't stop at just finding one or two answers

I've found dozens of mighty "unknown hero" reserves.

So I think the project should now move into beta and start recruiting potential individuals for prospective research.

So all we need is information

I was able to collect the DNA and asked, "What is going on with my information?

It is necessary to have the positive attitude of “Tell me about the results.”

Most of us spend our lives on the sidelines about things like health and disease.

We put the responsibility of understanding and treating disease on the chosen professionals We put the responsibility on the chosen professionals

For this project, each individual has a different new role, each individual has a new role, and to realize this dream, to participate in this open cloud project and find the "unknown heroes", to evolve from the current medical conception of resources and constraints, to move beyond the current medical conception of resources and constraints, to design preventive medicine, to understand childhood diseases, beyond childhood diseases, to Alzheimer's and Parkinson's diseases. and start asking, "What is our role? How can our genes help us?"

is needed

So instead of telling you, until now, that you have to go see a specialist somewhere, you're going to ask the genetic information that's inside you, and then share that information with everyone.

thank you

(applause)

In the mid-16th century, Italians were fascinated by a certain type of male singer, whose vocal range was astonishing and could produce sounds previously thought impossible for adult men.

But this talent came at a high price.

They were castrated before puberty to keep their voices from changing, to stop the action of hormones that lower their voices.

They were called castrati and were famous throughout Europe for their soft, angelic voices, but in the 1800s the cruel practice of creating these voices was banned.

Engaging vocal development greatly expands musical horizons, but even a naturally developed voice can be incredibly versatile.

As we age, our bodies undergo two major changes that give us a new vocal range.

So, what is the detailed mechanism of the vocal apparatus and what is the cause of the abnormal voice?

The specific sounds in speech are determined by many anatomical factors, most of which are determined by age, the condition of the vocal cords, and the size of the larynx.

The larynx is a complex organ of muscle and cartilage that supports and moves the vocal cords, more correctly known as vocal folds.

It lies between the thyroid gland and the arytenoid cartilage, and these two muscles form a stretchy curtain that opens and closes the trachea, the air-carrying tube in the throat.

These folds open when you breathe and close when you speak.

Air pushes against the folds that hold the lungs open, causing the tissue to vibrate and produce sound.

We don't have to concentrate like we do when we play a musical instrument, we change the sound when we speak without effort.

By pushing the air faster or slower, you change the frequency and amplitude of the vibrations, which are described as pitch and loudness, respectively.

A fast, small vibration produces a high-pitched, quiet tone of voice, and a slow, large vibration produces a low, growl-like voice.

And by moving the laryngeal muscles between the cartilages, you can stretch or contract the folds and intuitively play the instruments inside your body.

This process is the same from the first vocalization to the last vocalization, but as we age, the larynx also ages.

The first major change begins during puberty, when the voice begins to become lower.

This is due to the enlargement of the larynx, which elongates the folds of the vocal cords and allows them to vibrate more widely.

These long folds vibrate slowly and loudly, lowering the fundamental tone.

This growth is particularly noticeable in many men, due to their high testosterone levels, which initially leads to a cracked voice, then a lower, growl, and a protruding larynx known as Adam's apple.

Another development occurs at puberty, when the uniform tissue covering the folds transforms into three layers with different functions: a central muscle, a stiff layer of collagen wrapped in stretchy elastic fibers, and an outer mucous membrane.

These layers add nuances and depth to the voice, creating a distinctive timbre that differs from prepubescent timbres.

After puberty, most people's voices haven't changed much in 50 years.

But each person uses their voice differently, and over time they experience age-related damage to their larynx, known as dysphonia.

First, as our collagen stiffens, elastic fibers atrophy and decline.

This loss of flexibility makes older people's voices higher pitched.

But in women who are hormonally affected by menopause, swollen vocal folds cause more than offsetting changes in pitching.

The increased mass of the folds slows down the vibration of the vocal cords, resulting in a lower voice.

All of these symptoms are compounded by the lack of healthy nerve endings in the larynx, which leads to less precise muscle movement and a hoarse, hoarse voice.

After all, these anatomical changes are only part of the factors that affect the voice.

But keeping your voice in good shape can turn your vocal tract into a precisely tuned instrument that can sing operatic arias, atmospheric monologues, and inspiring speeches.

After a life full of adversity, over the years I've been inspired by how people find strength in the hard times and rise to their feet.

I've often heard that when you're in trouble, find meaning in it.

For a long time, I thought that "meaning" was there, and that great truths were waiting to be discovered.

But gradually I came to feel that the truth was irrelevant.

We say "find meaning," but we should say "create" to give meaning.

In a recent book, I wrote about how families perceive children with various disabilities and who are unusual.

One of the mothers I interviewed, who had two children with multiple severe disabilities, said, "People always tell me, 'God won't give you more than you can handle.' But these kids weren't always a gift from God.

We chose to think of it as a 'gift'."

We make choices like this over and over again in life.

When I was in second grade, there was Bobby Finkel's birthday party, and the whole class was invited, except me.

My mom thought something had gone wrong, so she called Bobby's mom, and she told me that Bobby didn't invite me because he didn't like me.

That day, my mother took me to the zoo and gave me a hot chocolate parfait.

When I was in seventh grade, a boy on the school bus nicknamed me "(Gay) Percy" because I acted gay.

Occasionally, he would join his peers in chanting his nickname and teasing him, all the while on the school bus, 45 minutes to go and 45 minutes to come back, "Percy! Percy! Percy! Percy!"

When I was in eighth grade, my science teacher said to me, "Homosexual men become faecal incontinence because of damage to the anal sphincter muscle."

I never went to the cafeteria until I graduated from high school, because if I sat with girls, they would tease me, and if I was with boys, they would tease me that I should be with girls.

I spent my childhood running away from problems and persevering.

What I didn't know at the time, but now I know, that experience of running away and enduring can be the first step in creating meaning from it.

After creating meaning, we take that meaning and make it a new identity.

Embrace your trauma and make it a new part of yourself, and then weave the worst things that happened in your life into your triumph stories to create a better version of yourself in response to what hurt you.

For the book, I interviewed a mother who was raped as an adolescent and had a child at that time, which ruined her life plans and destroyed all her emotional connections.

When I met her, she was 50 years old, and I asked her, "Do you think about the man who raped you?"

"I used to be angry about him, but now I just feel sorry for him," she said.

I thought he was sympathetic because he was immature enough to do such a terrible thing.

When I say, "Are you sympathetic?"

She said, "Yes, he has such a beautiful daughter and two wonderful grandchildren, but he doesn't know, only I know.

So I am lucky.”

Some of our challenges include the ones we were born with – gender, gender, race, disability and more.

Some things happen along the way, like being a political prisoner, being a rape victim, being hit by Hurricane Katrina.

Identity is also about entering a community, drawing power from that community, and empowering it.

Identity is turning the "but" into the "because," for example, "I'm here, but I have cancer," and "I'm here because I have cancer."

When we're ashamed, we can't tell ourselves, but those stories are the foundation of our identity.

Create meaning, build identity

Create meaning, build identity

this became my belief

To create meaning is also to change ourselves.

Shaping our identity is also about changing the world.

We all have stigmatized identities, and we face this question every day: How far do we limit ourselves in order to fit in? How far do you have to go to cross the line of "normal life"?

Creating meaning and building identities is not about correcting mistakes.

just make mistakes worthwhile

In January of this year, I visited Myanmar, interviewed political prisoners, and was surprised to find that they were less miserable than I expected.

Because most of us commit crimes on purpose and are incarcerated, we go into prison proudly, and when we serve our sentences years later, we come out proudly.

Ma Thida, a leading human rights activist who nearly died in prison and spent years in solitary confinement, says, "I am grateful to the guards for giving me time to think, gaining wisdom, and improving my meditation skills."

There she explored meaning and made the hardships she experienced her defining identity.

These people suffered less in prison than I expected, but they were also less pleased with the reforms that were happening in Myanmar than I had imagined.

Ma Thida says, "People say that we Burmese are very tolerant, even when we're under pressure, but underneath that charm is anger.

And the fact that there have been so many changes in the past doesn't erase the problems that pervade society.

My understanding is that what she's trying to say is that in a situation where only a few have a stake and it's not open to everyone, depending on where you sit at the table, you're served different food.

In other words, creating meaning and building identities doesn't stop rage.

I've never been raped, not even close to imprisonment in Burma.

But as a gay American, I've been exposed to prejudice and hatred, and I've created meaning and built an identity, and this is the way I've learned from people who have suffered more than I could ever know.

During my adolescence, I tried to be extremely straight.

I even went through what they called "sex therapy," where people called "doctors" prescribed what they called "exercises with women." Women were taught to call themselves "therapists." They weren't prostitutes, but they were nothing else.

(Laughter) My favorite is a blonde from the Deep South who eventually confessed that she was a necrophiliac and got into trouble in the morgue and got this job.

(Laughter) Through these experiences, I've finally had some happy physical relationships with women, and I'm grateful for that.

A big conflict was born inside me, and I ended up with a deep wound in my heart.

We don't seek painful experiences that shred our identities. We seek identity when we experience painful experiences.

We cannot endure meaningless pain, but we can endure great pain if we believe that pain has a purpose.

Difficult things are more memorable than easy things

You can be yourself without joy, but you won't be yourself without misfortune that pushes you to search for meaning.

"Therefore I will content myself with weakness," wrote the Apostle Paul in 2 Corinthians. "For when I am weak, then I am strong."

In 1988, I went to Moscow to interview artists from the Soviet underground art scene.

I thought their work would be radical and political.

But the radicalism in the film was about reintroducing humanity into a society that denied humanity.In some ways, Russian society is doing exactly the same thing right now.

One of the artists I met said, "We were training to be angels, not artists."

In 1991, I revisited the artists I interviewed, and I stayed with them during the coup that led to the collapse of the Soviet Union.

In fact, they were the people organizing the resistance to that coup.

On the third day of the coup, someone said let's go to Smolenskaya.

We went there and took a position in front of the barricade, and a little while later a line of tanks came up.

The soldier in the lead tank said, "We have an unconditional order to destroy this barricade.

If you give me a way out, I won't hurt you guys

If we don't move there, we have no choice but to run you over."

The artists I was with said, "Give me a minute

I will explain why we are here."

Then the soldier folded his arms, and the artist began to deliver a speech praising democracy, already living in a Jeffersonian democracy -- something that would never happen to someone like us.

Artists speak passionately, soldiers stare intently

After the speech was over, we sat there for a full minute. When he finally looked at us, drenched in the rain, the soldier said, "What you just said is true. We must follow the will of the people."

If you give me space to make a U-turn, I'll go back the way I came."

and went back to that street

Sometimes creating meaning can give you the words you need for ultimate freedom.

In Russia, I discovered a lemonade-like bittersweet fact: oppression breeds strength against it.

And over time, I realized that it was an integral part of identity.

I needed an identity to recover from my grief.

The gay rights movement approves of me being different

Identity politics has always had two sides: giving pride to those who have certain conditions and characteristics, and making the world around them more welcoming and kind.

They're completely different things, but if there's progress on one side, it affects the other.

Identity politics can also be narcissistic.

Celebrate the "difference" only because it's yours

People narrow their worlds, live in individual groups, and don't think about others.

But if understood correctly and practiced diligently, identity politics will promote the notion of what it means to be human.

Identity itself shouldn't be a selfish label or a gold medal, it should be a revolution.

Life would be easier if I was straight, but that's not me.

Right now, I prefer being myself to being different. To be honest, I don't have the option or the ability to imagine being different.

When you get rid of dragons, you get rid of heroes, and we all aspire to be heroic in our lives.

Sometimes I wondered, can I stop hating the part of me that's gay without publicly celebrating my pride in being gay? This speech is also an expression of pride.

I thought I really knew myself when I could just be gay without a second thought.

But when I was self-loathing, there was a gaping hole in my heart that I needed to fill with pride.

There will come a day when being gay will be a mere fact and will not be the object of protests and evacuation.

but that's still a long way to go

A friend of mine felt that gay pride was getting a little ahead of its time, and once suggested a "Gay Humility Week."

(Laughter) (Applause) It's a great idea.

it's still too early

(Laughter) Neutrality seems to be somewhere between despair and bliss, but it's actually the endgame.

In 29 states in the United States, I'm legally fired or denied housing because I'm gay.

In Russia, people were violent in the streets because of laws against homosexual propaganda.

27 African countries have enacted laws against sodomy.

In Nigeria, gay people are legally stoned to death, and lynchings are commonplace.

In Saudi Arabia, two men were recently sentenced to 7,000 lashes each for having sex, and they are now disabled because of it.

No one would be able to create meaning and build identity.

Gay rights aren't just about the right to get married. Millions of people live in situations where being gay is unacceptable, without support, and where their dignity is at stake.

I've been lucky enough to create meaning and build an identity, but that's really rare.

All gay people deserve proper justice.

But any progress is great.

In 2007, six years after we met, I decided to marry my partner.

Meeting John brought me great happiness, and all my misfortunes disappeared.

Sometimes I would become so preoccupied with the disappearance of that suffering that I forgot to feel the joy.

Marriage was to declare our love to exist here.

Right after we got married, we had kids, and it gave us a new meaning, a new identity for us and our children.

I want my children to be happy, and when they're sad, I love them so much it hurts.

As a gay father, I teach them to accept the "mistakes" of life.

A Buddhist scholar I know once told me that Westerners misunderstand that nirvana does not come when all suffering is over and we are waiting for the arrival of supreme joy.

It is not nirvana, for the bliss of the present is always overshadowed by the joy of the past.

It is said that nirvana is reached when one waits for the arrival of supreme joy and discovers the sprout of one's own joy in what can be thought of as sorrow.

I sometimes wonder if I could have found that kind of satisfaction in my marriage and children, and if I had taken them for granted, and if I had been straight all along, or if I was still young, would it have been easier for me to find it?

maybe so

Maybe all the complex imaginings that I did apply to other things as well.

But if searching for meaning is more important than finding it, then the question is not whether I was happier being bullied, but whether giving meaning to those experiences made me a better father.

I tend to find hidden bliss in the joys of everyday life, because even those joys were unusual for me.

I know people who are heterosexual and who are equally happily married and have families, and gay marriage is breathtakingly new, and their families are exhilaratingly new, and I found meaning in those surprises.

In October, I celebrated my 50th birthday and my family threw me a party.

In the meantime, my son said he wanted to give a speech to my husband.

John says, "George, you can't give a speech. You're only four."

(Laughter) "Grandpa, Uncle David and I are going to give a speech tonight."

But George threw it all together, and finally John took him to Mike, and George yelled out, "I'm sorry to all of you."

"Borrow your ears for a moment"

Everyone turned around in surprise

George continues, "I'm so happy it's my dad's birthday today.

I'm happy that everyone can eat cake

Dad, if we were younger, we would have been friends."

So- thank you, so I'm not even that Bobby Finkel.

I thought I owe it, because all my experiences were for this moment, and for the first time, I was just grateful for the life I was desperately trying to change.

Gay rights activist Harvey Milk was asked by a young gay man, "What can you do for this cause?"

There are always people who want to trample on our humanity.

There are many stories of regaining humanity.

By living with dignity, we can overcome that hatred and extend everyone's lives.

Create meaning, build identity

create meaning

build an identity

and share your joy with the world

thank you

(Applause) Thank you. (Applause)

thank you (applause)

(applause)

It was the fall of 1902, and President Theodore Roosevelt needed a little vacation, so he took a train to hunt black bears on the outskirts of the town of Smedes, Mississippi.

On the first day of the hunt, we didn't see a single bear, much to everyone's dismay, but on the second day, after a long chase, the hounds tracked down one. But by that time, the President had given up on the hunt and was back at his camp for lunch.

it was a female bear

Stupid, injured, horribly gaunt and mottled, when Roosevelt saw this animal tied to a tree, he couldn't pull the trigger.

He felt it went against what he was supposed to do as a sportsman.

A few days later in Washington, the scene was caricatured.

It's called "Mississippi Drawing the Line," and Roosevelt is muzzle down and arm outstretched to save the life of a bear standing on its hind legs with frightened eyes wide open and tiny ears on top of its head.

It was really helpless, like you wanted to crad it in your arms and comfort it.

It didn't look familiar at the time, but if you look at the caricature now, you'll immediately recognize the animal, and it's a "teddy bear."

This is how the teddy bear was born

Originally, a toy company took the caricature bear and turned it into a fluffy toy, named after President Roosevelt, a "teddy bear."

And I'm getting a little silly in deciding to take this stage and spend some time telling a 100-year-old story about the birth of a nostalgic childhood toy.

For some reason it reminds me of a teddy bear

In retrospect, it's exactly what we were meant for, because bears were so cuddly, the kind of thing that everyone wanted to give as a playmate to a child.

It looked the same as it does now, but nobody thought of bears that way.

In 1902, bears were monsters.

bears were a threat to children

To people at the time, bears were a symbol of all the dangers people encountered in remote lands, and in fact, the federal government was systematically trying to exterminate bears, as well as many other predators like coyotes and wolves.

These animals were seen as demonic

I was called a hitman because I killed livestock.

One government biologist explained the struggle with animals like bears: there's no place for them in our advanced civilization, so we're just wiping them out.

Nearly half a million wolves were slaughtered in just ten years.

Grizzly bears have been eliminated from 95% of their original territory. And you may have heard that once, when 30 million buffaloes moved across the plains, trains had to stop for four or five hours as these huge wriggling herds crossed the tracks.In 1902, fewer than 100 wild buffaloes survived.

So what I'm trying to say is that the teddy bear was born in the midst of this epic series of genocides, and you could think of it as an indication that somewhere in your heart, some of you started to struggle with that carnage.

America still hated and feared bears, but suddenly America wanted to give them a big hug.

For the past few years, I've wanted to know

How we imagine, think, and feel about animals, and how the way we feel about them is imprinted and overwritten in our minds.

We're living in the midst of this great extinction storm that will wipe out half the planet's life by the end of the century, so why did we start caring about certain animals over others?

Now, the relatively new field of social science is beginning to explore these questions, revealing a powerful, and sometimes quite schizophrenic, relationship between us and animals. And what I can tell you, after spending a lot of time reading the journals, is that the knowledge we're getting is surprisingly wide-ranging.

Some of my favorites are that people in upstate New York who watch a lot of television are more afraid of being attacked by black bears.

Also, when Americans see a tiger, they tend to assume it's a female, not a male.

In one study, when fake snakes and turtles were placed on the side of the road, the snakes were more likely to be run over than the turtles, and about 3% of the people who ran over either seemed to do so intentionally.

Women are more likely than men to feel "enchanted" when they see dolphins in the waves.

Sixty-eight percent of the "entitled and self-esteem" mothers identified with the dancing cat in the Purina commercial (Laughter).

Wild turkeys are seen as slightly more dangerous than otters, and pandas are twice as adorable as ladybirds.

Is there a reason for your appearance?

We feel more familiar with animals that look like us, especially those that look like human babies, with big, forward-facing eyes, round faces, and plump builds.

This is why Christmas cards from my great aunt in Minnesota feature fluffy penguin chicks instead of grotesque spiders.

But looks aren't everything, right?

There's a cultural dimension to the way we think of animals, and stories about these animals -- like all stories -- are shaped by the time and place in which they're told.

So think back to 1902, when a ferocious bear became a teddy bear.

how was the situation? America was urbanizing

For the first time, most people lived in cities, creating a distance between nature and humans.

There was a safe distance to rethink and dream about bears.

Nature just started to look like this, pure and lovely, because there was no longer anything to fear.

You'll find that this sequence is repeated in every animal.

Seeing animals as demons, aiming to eradicate them, and when they are on the brink of eradication, they feel sympathy for the weak and want to show mercy--I can't seem to get out of this dead end.

We exert power, but because of that power, we are unstable.

For example, here's one of thousands of letters and drawings sent to the Bush campaign by children asking for the protection of polar bears under the Endangered Species Act, in the mid-2000s, at a time when awareness of climate change was skyrocketing.

Many times, we've seen polar bears grumpily stranded on ice floes.

I spent some time researching these materials.

All of them are nice letters. I like this letter too.

Can you see the polar bear drowning and being eaten by lobsters and sharks?

This letter is from a kid named Fritz, and he has a solution to climate change.

Ethanol-based solution

he said

"I like polar bears and I feel bad for them.

Fritz could use corn juice (ethanol) in the car (instead of gasoline)."

Two hundred years ago, an Arctic explorer wrote that polar bears boarded boats and tried to devour them, even if they tried to set them on fire.

We thought of polar bears as the mysterious and fearsome rulers of the Arctic.

But now, how quickly climate change has upended the image of animals in our minds.

From bloodthirsty killers to vulnerable drowning victims, the image of the polar bear has changed. Come to think of it, it's sort of the conclusion of a story that began to be told by Teddy Bear in 1902, when America had just finished conquering its own continent.

And I was just about to finish off the last wild predator.

Now, the categories of our society have reached all the way to the Arctic, making even the most remote and mightiest bears on earth look like lovable and innocent victims.

But there's a sequel to the teddy bear story that many people don't talk about.

Let's talk about that. Although the toy exploded in popularity not long after Roosevelt's hunt in 1902, most people assumed it was a passing fad, a silly piece of political merch that would fade with the presidency.

it didn't go well

That January, Taft was the guest of honor at a banquet in Atlanta.

I was going to treat him with a delicacy called "opossums and potatoes," a local dish of the South.

A whole roasted opossum sits on top of a sweet potato, sometimes with the tail still attached, like a meaty thick noodle.

It was over eight kilograms that was served to Taft's table.

After dinner, the orchestra began to play music, and the audience began to sing. Suddenly, Taft was surprised by a gift from a group of local supporters: a stuffed opossum with beaded eyes and bald ears, a new product they had developed as the William Taft administration version of President Roosevelt's teddy bear.

They called it "Billy Possum"

Within 24 hours, the Georgia Billy Possum Company was busy preparing to market them nationally, and the Los Angeles Times proudly announced, "The teddy bears will be thrown out, and for four years, maybe eight years, kids in the United States will be playing with Billy Possums."

From then on, opossums became popular for a while.

Billy Possum Postcard or Badge Pilly Possum Pitcher for Tea Time Cream

There was a little billy possum on the cane so the kids could wave it like a flag.

But despite all this marketing, Billy Possum's lifespan was pitifully short.

The toy suddenly stopped selling, and by the end of the year it was almost completely gone, which meant that Billy Possum didn't hold out until Christmas time, which was a particular tragedy for toys.

I can explain the failure in two ways.

one is pretty obvious

And let me be clear here, because opossums are ugly.

Think about it, for most of human evolutionary history, our impression of bears was that they were creatures who were completely separate from us.

In other words, it was a creature that lived without rivalry as a threat.It was a creature that lived without rivalry as a threat.

By the time Roosevelt went hunting in Mississippi, the figure was crushed, and the figure tied to the tree for him became the symbol of all bears.

The survival or death of those animals depended entirely on the sympathy or indifference of the people.

This casts a very ominous shadow over the future of bears, but if even the survival of such animals were up to us, it also hints at a great deal of anxiety about our fate.

So a century later, if you're paying any attention to what's going on in your environment, you're going to be even more perplexed.

We live in what scientists have begun to call "protection dependence," and that term means that we've destroyed so much that nature probably can't stand on its own, and that the vast majority of endangered species can't survive without us disappearing from a land built to their liking.

Now, we are committed to conservation, we can never let go, and we have an incredible amount of work to do.

Now we're training condors not to perch on power lines.

Whooping Cranes are taught to fly south during the winter months on the back of ultralight planes.

give ferrets plague vaccine

Monitor pygmy rabbits with drones

Instead of letting species die out, we now micro-manage many species to survive indefinitely—but which species?

They're the creatures of the fascinating stories I told you about, the ones we've decided should continue to exist.

The line between conservation and domestication is blurry.

I keep saying that the stories we tell about wildlife are so subjective that they can be silly, romantic and sensational.

sometimes it has nothing to do with the facts

But in a protection-dependent world, those stories have very real consequences, because how we feel about animals now affects their survival more than anything you read in your environmental textbooks.

"Telling a story" is important now

"Emotion" has a meaning

Our imagination has become a force on the environment.

And perhaps the teddy bear played a role, because the lore of President Roosevelt and that bear of Mississippi was an allegory about the great responsibility that society was beginning to face at the time.

There are 71 years left until the Endangered Species Protection Act expires, but this fable seems to sublimate people's currents of thought into a scene of stained glass.

"The bear was a poor victim tied to a tree," and "The President of the United States decided to show mercy."

thank you

(Applause) [Illustration by Wendy McNaughton]

What does augmented reality and professional football have to do with empathy?

"What is the flight speed of an unladen swallow?" "What is the flight speed of an unladen swallow?"

Unfortunately, today I will only answer one of these questions, so please don't be too disappointed.

When most people think of augmented reality, they think of "Minority Report" and Tom Cruise waving his hand, but augmented reality is not science fiction.

People need to realize that augmented reality is something that happens in our lives, and it happens because we have the tools to make it happen, because augmented reality can change our lives as much as the internet and cell phones.

So how do we get to augmented reality?

The first step is what I'm wearing right now, Google Glass.

I think many of you are familiar with

What you probably don't know is that Google Glass is a device that lets you see what I see.

You can use it to experience what it's like to be a professional athlete on the field.

Right now, the only way you can stand on the field is to let me describe it.

using only words

You have to put together a composition that satisfies your imagination.

With the Google Glass under my helmet, I can run 100 miles an hour across the field and feel what it feels like to hear my heart beat in my ears.

You get a sense of what it feels like to be a 110-kilogram man sprinting toward you and trying to beat you with all his weight.

I've always been on the side of being hit, but it's not comfortable

Now, to give you a taste of what it's like to have Google Glass under your helmet, I've come up with a video to show you.

Unfortunately, the footage isn't the actual NFL, because the NFL thinks that "advanced" technology is going to be, for example, submarine "Surface," but -- (Laughter) -- let's do what we can.

Now play the video

(Video) Chris Crew: Let's go.

Ah, I'm tired of being tackled

wait a little closer

ok ok

let's go!

Chris: As you can see, I was able to get a taste of what it feels like to be tackled on the football field from the perspective of the tackler.

Now, as you've probably noticed, we're missing some of the rest of the team.

We've got some videos courtesy of the University of Washington.

(Video) Quarterback: Mice's number 54!

Blue number 8! go! go!

Ah!

Chris: Again, this footage makes you feel like you're on the field a little bit, but this is very different from being in the NFL.

Fans want that experience

I want to stand on the NFL field

Fans want to be their favorite player, and you've already heard it on YouTube and Twitter, and they're saying, "Hey, do you have any quarterback stuff?

What about the running back?

I want to feel it."

I used to have that experience with a GoPro and Google Glass, how can you make it real?

How do you go to the next dimension?

Now, with something that some of you may be familiar with, it's called the Oculus Rift, we've taken it to the next level.

The Oculus Rift is one of the most immersive virtual reality devices ever, and that's no exaggeration.

I'll show you why in this video

(Video) Man: Oh!

No no no no! I don't want to do it anymore! Yada!

God! Ahhh!

Chris: This is a man's life-threatening roller coaster experience.

If we filmed Adrian Peterson sprinting across the line and shoving a tackling player with his arms outstretched before sprinting for a touchdown, what do you think it would be like for the fan experience?

If he were Messi, sprinting down the pitch and scoring goals in style, or Federer serving at Wimbledon, what would the fan experience be like?

If you were an Olympic downhill skier and you were to slide down a mountain at a speed of over 112 kilometers per hour, what would it be like for you?

I think adult diapers will sell quickly.

(Laughter) But this is not augmented reality yet.

This is nothing but virtual reality (VR)

How do we get to Augmented Reality (AR)?

When we get to augmented reality, it's when coaches and managers and owners look at streaming information that people want to see and say, "How are we going to improve this team?

Will it help me win the match? ”

Teams always use technology to win games

I want to win because I can make money

So let me tell you a little technology story about the NFL.

In 1965, the Baltimore Colts put wristbands on their quarterbacks to communicate their plans sooner.

and won the Super Bowl that year.

Other teams followed suit

It will be a fast and exciting match.

more people watched the game

In 1994, the NFL put radios in the helmets of quarterbacks and later defensemen.

And because it's faster, it's got even more fans.

it was more fun

In 2023, you are the athletes, and when you return to the huddle, the clear plastic visors you're already wearing will show your next move in front of you.

I no longer need to worry about forgetting

No more worrying about remembering formations

just show up and respond

Coaches really want this device because forgetting to give instructions leads to losing the game. Coaches hate losing games.

If I lose, I will lose my coaching job.

i don't want that

But augmented reality doesn't just make formations easier to remember, but augmented reality doesn't just make formations easier to remember.

Augmented reality is also a way to record all the data and use it instantly to improve the way we play games.

What is it like?

Perhaps the simplest of these devices is cameras, which can be mounted at the four corners of a stadium and have a bird's-eye view of all the people there.

We also have information about helmet sensors and accelerometers, technologies that are still in development.

All that information will be shown to the players via streaming.

Good teams deliver for players to use

Inferior teams will have information overload

It is a factor that determines the superiority of the team

And now the IT department is just as important as the scouting department, and data mining isn't just for geeks.

It's also for athletes, right?

What will it look like on the field?

you are the quarterback

When I receive the snap and go down a little

Look for free players and run your eyes on the enemy line

Suddenly, a bright flash on the left side of the visor tells you that you've entered the linebacker behind you.

You can't see this movement normally, but you can see it in augmented reality.

seems to be cornered

Another blink found a free player

Throw a pass but get tackled while throwing

lose sight of the ball

where did the ball go...

The receiver's visor makes part of the turf brighter, so correct the trajectory and run.

Catch the ball, sprint, touch down.

Audiences are engrossed and fans are with him watching every step he takes.

This is what makes the game incredibly interesting This is what makes the game incredibly interesting

I think a lot of people will be watching the game because they want to have this kind of experience.

fans want to be on the field

they want to be favorite players

Augmented reality will become one of the sports, because it's so lucrative.

But I'd like to ask you guys, is this the only reason you're using augmented reality?

Do we just use it for things like “food” and “entertainment”?

I believe we can do something more with augmented reality.

I believe that augmented reality can be used to foster empathy among humans by literally showing them what it's like to walk a mile in someone else's shoes.

I know this technology is valuable for sports leagues I know this technology is valuable for sports leagues

worth billions of dollars a year

But what value does this technology have for a classroom teacher trying to teach a bully how bad his behavior is in a victim's mindset?

What's the value of gay Ugandans and Russians trying to expose to the world what it's like to live under persecution?

What value does this technology have to Colonel Hadfield and Neil deGrasse Tyson, who are trying to push children to become more enlightened about space and science, not moneymaking or entertainment gossip?

Ladies and gentlemen, augmented reality is just around the corner.

The questions we ask, the choices we make, the challenges we face, it's always up to us

thank you

(applause)

I'm excited to be here to talk about veterans. I didn't join the military because I wanted to go to war.

It's not like I had the desire or the need to cross the sea to fight.

The reason I joined the military, quite frankly, was because college was ridiculously expensive and the military supported it, and I joined the military because that's what I knew and thought I could do well.

I'm not from a military family.

I'm not the son of a soldier

No one in my family has ever enlisted. I first learned about the military when I was 13 years old when I was sent to military academy.

I was a problem child and my mother always said, "If you don't do well, you'll be sent to the military academy."

I replied, "Mom, I'll do my best."

And when I was nine years old, my mother started showing me pamphlets.

By the time I was 10, 11, my behavior kept getting worse.

By the time I was 10, I had passed my grades, I was warned for my behavior, and I was 11 when I was handcuffed for the first time.

And when I was 13, my mother said, "I can't take this anymore.

I'm going to enter the military academy."

I looked at my mother and replied, "Mom, I know you're angry. I'll do my best."

I was told, "No, I'll be starting next week."

That's how I discovered the military, and my mom thought it was a good idea.

I have to be really against that, because in the first four days that I actually started going there, I already ran away from school five times.

There are five big black gates around the school, and every time the teacher looks away from me, I just walk out of those gates, as the teacher suggests, if you don't want to be here, you can always leave.

So I say, "If that's the case, I'd love to go home." It never worked.

i kept trying to escape

But ultimately, after spending some time there, I realized that by the end of my first year at the academy, I had matured.

The things I learned at this school, the discipline and hierarchy I learned, were things I didn't know before. It made me feel like I was part of a team that was part of something bigger.

And when I finally graduated from high school, I started thinking about what I wanted to do, and probably like many other students, I didn't know what it was or what I wanted to do.

I thought of the people I admired and admired

I thought a lot, especially the people I had met in my life that I admired.

They were all wearing United States uniforms, so it was really easy for me to answer that question.

When I asked him what he wanted to do, he immediately answered, "I'm going to be an officer in the army."

The military trained me according to procedure, and they said that I didn't join the military because I wanted to go to war, but in fact, in 1996, when I joined the military.

when nothing special happened

never felt unsafe

I went to my mother -- I was 17 when I first enlisted, and I needed my parents' permission to join -- and I gave her the necessary paperwork.

It's like, "It's been good for this kid so far, let's keep it going." The mother has no idea that the papers she's signing register her son as an officer.

I go through the enlistment process, and even at that stage, I was thinking, 'Yeah, I've done it. I'm going to have an occasional weekend or two weeks of intensive training.'

After 9/11, the path I chose was something else entirely.

I didn't enlist to fight, but I was in the military, and fighting was my duty.

I thought a lot about the people I was going to lead.

Shortly after 9/11, three weeks later, I was on a plane going abroad, but not with the military, because I had a scholarship to go to school abroad.

I went abroad on a scholarship to study and live there. I went to England, which was a very good experience.

At that time, they were about to throw themselves into a place that almost no one knew about, and that even those of us who had been trained hadn't even shown us a map.

As I spent two years in my master's program in graduate school, and as I sat at my desk in an Oxford building that was built hundreds of years before the United States of America, and my teacher and I discussed the assassination of Archduke Ferdinand and its impact on the start of World War I, my heart and mind were always on my men.

it was the new reality

By the time I finished graduate school and returned to the army and was about to be dispatched to Afghanistan, I hadn't even fought my first battle yet, and some of my subordinates said they would be dispatched for the second and third time.

I remember the first time I went out in the military, and when we went on combat missions in the military, we all checked each other's shoulders, because that's where the insignia was.

So when I meet other members, I shake hands first, then I look at their shoulders, because I want to know which or which unit they joined.

I was the only member of the squad at that time without an epaulette.

It's just an opportunity to talk to my men, so I'll ask them why they enlisted.

Because college was expensive for me.

Many subordinates have completely different reasons

enlisted out of a sense of duty

Enlisted with anger and wanting to do something

A person who enlisted because his family told him it was important

Those who enlisted in hopes of some form of revenge

everybody had different reasons

They were all crossing the sea and fighting in conflicts.

What surprised me was that I started hearing a cliché that I never quite understood. You probably heard people start using it right after 9/11, "Thank you for your hard work."

I just followed suit and started saying the same thing to my men.

It was before I left for the mission myself.

I had no idea what it meant

It just sounded right to say

Because I thought it was the right word to say to someone who served in the military abroad.

"Thank you for your hard work"

But I didn't know the background to the term, nor what it meant to the recipient.

When I first returned from Afghanistan, I thought that if I could survive the conflict, that would be the end of all the danger.

I thought that if I could come back from the conflict zone, I would just wipe my forehead and say, 'I'm glad I survived.'

it continues in our hearts

it continues in our memory

it continues in our emotions

Forgive me, even though we hate being in the crowd

Forgive me, we're going to be in total blackout for a week, and we can't use white light, because white light can be seen from miles away, whereas weak green or weak blue light can't be seen from far away.

So please forgive me, even after a week of total blackout, we find it difficult to adjust even when we return to the middle of Times Square.

Forgive me, when I went back to my family, where I lived without myself. Now that I'm back, it's hard to settle into a sense of "normal" because "normal" has changed.

I remember when I got home, I wanted to talk to everyone.

I wanted everyone to hear what I've been through

I wanted you to come and ask me, "What did you do?"

I wanted you to come to me and say, "How was it? How was the food?"

"What kind of experience did you have? How did you spend your time?"

But the only question I was asked was, "Did you shoot anyone?"

And that's all people came to ask

This is because there is fear and concern that what you say might hurt someone or trigger something.

The problem with this is that it makes us feel like we don't know what we're doing, or that we don't care.

"Thank you for your hard work" This is the end

What I wanted to understand more was the background and why "Thank you for your hard work" wasn't enough.

We're actually surrounded by 2.6 million veterans, both men and women, who have returned from Iraq and Afghanistan.

Sometimes we know that person, sometimes we don't. Just that feeling, that shared experience, that shared bond. We know that experience in our lives.

We think about "Thank you for your hard work." People ask, "So what does it mean to you?"

For me, it's about knowing our story, knowing who we are, knowing the strength that so many people have, knowing the strength of our people, and knowing how much our mission means.

"Thank you for your hard work," is to know that just because we came home and took off our uniforms, our mission wasn't over so easily.

In fact, there is still so much more that can be given and given.

For example, our friend Taylor Uruela, who lost his leg in Iraq, had two big dreams.

One is to be a soldier, the other is to be a baseball player.

he loses his leg in iraq

Rather than returning home and thinking that my second dream was over because I lost my leg, I decided to pursue my dream of becoming a baseball player and started a group called VET Sports, which is now a group of veterans across the country who enjoy sports as part of their healing.

Take Tammy Duckworth, for example. She was a helicopter pilot. Her helicopter needs two hands and two legs to steer.

You try to make it land safely, but the helicopter doesn't land safely because it doesn't respond to the commands her legs are giving out, and that's because her legs were blown off.

she survives

A medic saved her life, and then she's treated at home, only to find out, "My work isn't done yet."

And now I'm using my voice to serve as a legislator in Illinois, speaking out for a variety of issues, including veterans' issues.

We enlisted because we love the country we represent.

We enlisted because we believed in cause and we believed in our neighbors.

What we just want is that "Thank you for your hard work," should be more than just a quote. We want "Thank you for your hard work," to simply mean a heartfelt statement to the soldiers who came forward for the mission.

These are the people I work with and the people I'm proud of.

Thank you for your attention.

(applause)

How many of you have had your doctor ask you about your sex life?

What about mental health?

What about drinking?

These questions are very common

So who ever asked you about money?

There are very few people like that.

But that's strange, because child poverty is more epidemic in America than in most high-income countries.

Poverty can increase stress hormone levels and impede brain development.

Poor children in America are 1.5 times more likely to die and are twice as likely to be hospitalized than middle-class children.

So my colleague Dr. Michael Hall and I decided to ask mothers about money.

We knew we needed to rethink what we could do during the hospital visit to lift children out of poverty and give them the chance to live a healthy life.

Our question has come to an amazing solution: tax deductions.

The earned income tax credit, or EITC, turned out to be America's best anti-poverty remedy.

The EITC makes the average mother $2,000 to $3,000 per child per year.

Households with that income have healthier mothers and babies, which means fewer depressed mothers and heavier babies at birth.

But one-fifth of deductible households don't get deductions, and most of those who do lose hundreds of dollars in payments to for-profit tax return providers.

One day, a mother asked me, "Can't you file your tax returns while you're doing this?"

(Laughter) I think we can all relate to that suffering.

That's why we started StreetCred, an organization that helps pediatric clinics complete their tax returns.

This experiment was completely new and made me question my sanity.

After all, we are doctors, not tax accountants.

But the doctor has something that the tax accountant doesn't: the opportunity to connect with family.

Over 90 percent of children in America see a doctor at least once a year.

Parents trust their doctors and will do anything for a better life for their children.

Physicians in clinics across the country could join this effort, it's really easy.

By registering your practice as a tax filing venue, everyone from medical students to retirees can become volunteer tax return preparers after passing the Internal Revenue Service exam.

It's not as hard as you think, I guarantee you

I thought I would never go through someone else's tax procedures, but now I'm doing it.

It's been almost three years since we started this initiative.

In the first two years, 750 families received $1.6 million in refunds in Boston alone.

This year -- (applause) this year, we've increased the filing venues to nine locations in four states.

63 percent of the households who visited had never heard of the EITC.

Is there a procedure to obtain something I've never heard of?

Half of the households had never used free tax return preparation

$2000-3000 this year will contribute significantly to the family budget.

Let's take a look at food issues

It costs $477 a month for a mother and her two children to eat nutritious, low-cost meals.

With the EITC rebate, this family can cover five to six months of food expenses.

what about medicine

Twenty million children in America are missing out on the standard of care of modern pediatric medicine.

And the average medical cost per child is only $400 a year.

With EITC reimbursements, we can fix the health care denial.

This money, perhaps more than anything else, could be a beacon of hope for a mother.

A mother used her refund money to pay for her son's study abroad in Spain.

Paying the rent was a heavy burden for the mother, but in her eyes the tax refund was the door to a prosperous future for her son.

We have a chance, as doctors and as Americans, to get to the heart of the problem of poverty.

We can rethink health care as a place to deal with the many causes of disease, whether it's an infectious disease or a financial problem.

thank you

(applause)

The first time I tried a dating site was in my freshman year of college, and for those of you who can't see wrinkles, it was 2001.

As you can see, I was over 1.80 cm tall, and after entering the college of my choice, I learned that the national average for male basketball players in Division 3 was about 173 cm.

Dating back then was more or less the plot of "You've Got Mail."

After weeks of long emails, we finally meet face to face.

But in my case, I realized it wasn't a good match and went back to square one.

Dating has changed a lot in the last 17 years, but many of the frustrating factors haven't changed.

because dating is good at

This is because it is to increase the number of lover candidates beyond the social and professional activities of that person.

So what's wrong with dating?

just everything else

(Laughter) A little bit about me.

So when things don't work out, I step back and find the problem and solve it with the methods that I use in business.

it's the same in love

The summer before I turned 30, I took a break from looking for a boyfriend

I went camping alone in Maine for a week and reflected on my lackluster love life.

I really knew what I wanted in a partner.

kindness, curiosity, empathy, purpose

But what I was looking for online was an Ivy League graduate who was taller than me and who lived within 12 stations of my house.

I didn't consciously prioritize these conditions, they were just the easiest items to check on the internet.

It's like looking at a resume, it looks great on paper, but in reality it doesn't really fit.

So in the spring of 2016, I decided to go back online and recreate this process in a typical business way.

First, I used OkCupid because I wanted to avoid the game-like feel of a swipe app.

It's to look at what the other person has written and judge the quality.

Next, I narrowed down my "potential customers." Instead of picking my favorite type, I defined criteria for identifying "prospects" who were a good match.

Only emails that met three criteria were accepted: they consisted of complete sentences with correct grammar; they referenced my profile; they weren't copied and pasted;

I thought the criteria should be lenient, but out of the 210 messages I received, only 14% cleared.

(Laughter) The next step is to meet in person as soon as possible, because the internet doesn't tell you what I care about.

But based on research and my own experience, it only takes 30 seconds to know if you're compatible with someone.

And that's where we came up with the idea of ​​"zero dates."

this is 1 hour and 1 drink

It's about answering the question, "Would you like to have dinner with this person?"

Not "Are you the lucky one?"

Just like that, "Do you want to spend three hours across the table with this person?"

I'll tell you that it's really only one hour. I have a drinking party with my girlfriends, a conference call with China, or anything else.

"1 hour" is important.

If it looks good, let's set a date for the first date.

If not, you can get away with it in entertainment mode and make it a topic of conversation at the next social gathering.

And since it's only an hour, you can meet with three people in one night, so you can get your hair done and choose your clothes once a week, right?

On zero dates, I was able to see how people reacted when I asked them to meet.

I expected that some people wouldn't be able to get into serious mode, and I was right.

Of the 29 candidates, only 15 responded to me, and six of them ended up with zero-date commitments.

My first opponent was a set designer.

We were both into yoga and loved peanut butter bagels, so I was really looking forward to it.

But after two minutes, I knew I wasn't a good fit for this person, and I was relieved that I didn't have to go to dinner.

After that, I was a little timid about the next zero date.

We had already arranged to meet in Brooklyn Heights, where we would bring whiskey and watch the sunset, which was two blocks from my house, to be honest.

He and I both had podcasts, so I thought, worst case scenario, we could just talk about it.

The man I met like this is Chas

He was kind, he was empathetic, he was a good joker, and he was even better at asking questions.

He's a lawyer, he's a writer And when he smiles, his eyes sparkle, and when I kiss him, he closes his eyes And that night, a zero date turned into a first date.

Two years later, we share a washer and dryer and two houseplants.

Now, I can't promise if it will come with houseplants.

The point of this story is that dating isn't all bad.

Don't treat it like a game or resume

Use it to find and narrow down your "prospects," and bring them to offline zero-dating as soon as possible.

'Cause the purpose of dating isn't to swipe

it's about finding someone who fits you

I wish you the best

(applause)

Please watch this video

Which one is the real President Obama?

(Barack Obama) Investing in things like helping families refinance their mortgages, investing in high-tech manufacturing, clean energy and infrastructure creates good jobs.

(Speaker) Do you understand?

All the answers are fake

(Laughter) None of them are real.

Let's talk about the journey so far

What inspired me to do this research was a project to preserve the last chance to learn from Holocaust survivors.

You can interact with holograms of Holocaust survivors under the name of "New Dimensions in Testimony"

MAN: How did you survive the Holocaust?

(Hologram) How did you survive?

I believe I survived because God was watching over me.

(Speaker) The answer was pre-recorded in the studio.

the effect is dramatic

I feel a strong connection to the person's story and to themselves.

There's something special about human interaction, I think.

And it got me thinking, what if we could build a model like this for everyone?

It's a model that looks, talks and behaves like you.

So I started thinking about whether it was possible, and I came up with a way to create a model of the person from just existing photos and videos, and I came up with a way to create a model of the person.

If you can just use the materials that are available, such as photos and videos, you will be able to create a model for anyone.

By the way, this person was Richard Feynman, who was not only a Nobel laureate in physics, but he was well known as an excellent teacher.

It would be wonderful if we could bring Feynman back to life and talk to millions of young people, to inspire them, and even get them to speak in other languages.

Or if you could ask your deceased grandfathers and grandmothers to give you some advice and heartwarming words.

The tool could also be used to have authors, living or not, read aloud to themselves.

The creative possibilities with this are endless and very exciting.

let me tell you how it works

First, we developed a method to create a detailed 3D model of the face from any image without 3D scan data.

This is the same model from a different perspective.

This technique can also be applied to video, applying the same algorithm to each frame of the video to generate a three-dimensional model in motion.

Here's the same model from a different angle.

This problem is very difficult, but the key is to analyze a large number of photographs of the person in advance.

For George W. Bush, all you have to do is do a Google image search, and from there you can create an average model, and then incrementally refine the model to recreate facial details like wrinkles.

The nice thing about this is that the photos can be very ordinary.

It doesn't really matter what it looks like or where it was taken.

The important thing is that there are many photographs.

We don't have color yet, so next we'll develop new blending techniques and refine the average model to add sharper facial textures and colors.

You can do this for any facial expression

Now we have a model of the person that can move, and the motion will be coordinated with the series of photos.

Note that wrinkles appear and disappear depending on facial expressions

You can also use video to move the model.

(Daniel Craig) Yeah, but we've managed to bring in some even better people.

(Speaker) Now we can do something interesting.

What you see here is a celebrity model made from a photo on the internet.

All faces can be moved according to the movement of the input source video.

CA: This is a tough bill to pass, and it has a lot of components that could make the legislative process ugly.

(Applause) (Speaker) So, going back a little bit, our ultimate goal is to capture each person's unique way of speaking and laughing.

Can a computer learn to imitate the way a person speaks by simply showing them a video of the person speaking?

So I decided to show the computer 14 hours of Obama's speech.

This is a video generated entirely from Obama's speaking voice.

(Obama) The results are clear.

American industry created 14.5 million new jobs in 75 months.

(Speaker) What's being synthesized here is just the mouth, and it looks like this.

Our system uses a neural network to convert incoming speech into points representing mouth positions.

(Obama) I get it through work and through Medicare and Medicaid.

(Speaker) And then we synthesize textures, fill in details and teeth, and embed them into the head and background of the original footage.

(Obama): Women get free health checks, and they don't pay extra just for being a woman.

Children can use their parents' insurance until they turn 26.

(Speaker) The result is very real and interesting, but at the same time, it's kind of scary, even for me.

Our goal is to create an accurate model of a person, not to impersonate anyone.

But I fear that this could be misused.

We've been thinking about this problem ever since Photoshop came along.

As a researcher, I'm also developing countermeasures, and I'm participating in an effort at the AI ​​Foundation that uses a combination of machine learning and human moderators to counter my own research to detect fake images and videos.

One tool we're planning to roll out is Reality Defender, a browser plugin designed to warn you about potentially fake content.

(Applause) And yet, before it's even verified, fake footage can do a lot of damage, and fake footage can do a lot of damage, so it's important that we all understand what's possible right now, so that we can make the right assumptions and look at things with a critical eye.

It's going to take a long time before we can create a complete model of a person, and it's safe to do so.

But I'm hopeful and enthusiastic because, when used correctly and carefully, this technology can empower everyone to have a positive impact on the world at large, and help build the future we all want.

thank you

(applause)

I'm really, really happy to be here.

What I would like to share with you is not the basics, but it is about my disease, and I don't know a lot about this disease.

I was born with this rare syndrome, and I'm one of only three people in the world who have it.

Because of this disease, I'm basically unable to gain weight.

would be envious

(Laughter) I can eat whatever I want, whenever I want, and I really don't gain weight.

I will be 25 years old in March and have never weighed more than 29kg.

When I was in college, I hid it -- maybe I didn't hide it because everyone knew it -- but I kept all the sweets in a big container. My roommate would often tell me that he could hear me reaching for food under my bed at midnight.

And yet I say, "I can do that!"

That's the good thing about this disease

you don't gain weight

have a visual impairment

to be very thin

People often wonder, "Lizzie, how can you say this is a good thing?"

Let me tell you about the benefits of this disease. It's great.

I wear contacts, but it's only one side, so the price is half.

(Laughter) It's half the prescription for reading glasses.

Stand on the right side when someone annoys you or treats you rudely.

(Laughter) Because they don't even know they exist.

Even now, if I stand like this, I don't know what the venue is like

I'd like to take advantage of my slim body and go to diet classes and gyms as a volunteer and say, "I'm Lizzie. I want to appear in advertising."

They'll put on makeup or whatever, and they'll say, "That's what I've seen with this program."

I was raised 150% normal

I was the first child for my parents

When I was born, the doctor told my mother, "I don't have amniotic fluid.

Not at all."

That's why it was a miracle that I was born and gave my first cry

The doctor told her parents, "Be prepared, your daughter can't talk, walk, crawl, think, or do anything on her own."

"Why? Why? Why does the first child have to deal with such unknown problems?" you'd think the first-time parents would say.

but it wasn't

The first thing my parents said to the doctor was, "Let me see my daughter, and I'll take her home. I'll love her, raise her, and do the best we can as a family."

and he did so

Almost everything I've been able to do is because of my parents.

my father is here today my mother is watching at home

mama are you watching? (Laughter) My mother is in recovery after surgery.

Thanks to my mother, my family was united Thanks to my mother, I was able to overcome it Thanks to my mother, who taught me the fighting spirit, I can speak proudly in front of you all today, "There have been hard times up until now, but

That's fine."

That's fine. There were scary things and tough times.

The hardest thing, I'm sure, as you've grown up, is something that you, and everyone in this room, has gone through.

Do you know what it is?

It starts with B in English, do you understand?

(Venue) Boys! (Boy) (Lizzie) Boy?

(laughs) Bullying!

(Laughter) I know how you feel.

(Laughter) I wish I could have sat on that side.

I did not know

I didn't know how other children would see me.

It was a big shock for a 5-year-old on his first day of kindergarten with a Pocahontas backpack.

Everything was ready!

(Laughter) My backpack was so big that it looked like a tortoise shell, but when I approached a little girl and smiled, she looked at me like I was looking at a monster, like I had seen the scariest thing ever.

I thought to myself, "I'm so sorry."

(Laughter) I was a fun girl, and she was the ostracist.

Next time I decided to play with blocks, no, maybe with a boy.

(Laughter) (Lizzy Laughter) I thought things would get better over time, but they didn't.

It just got worse, and I tried to keep everyone out of me, but I didn't understand why.

why? what did i do You're not doing anything!

I thought I was cool

I went home and asked my parents, "What's wrong?

what did i do why do you hate me ”

My parents sat me down and they said, "Lizzie, the only thing different about you is that you're thin.

You have an illness, but it doesn't determine who you are."

My parents said, "Go to school, look up, smile, be yourself, and others will see that you are the same."

I did it

I invite you to take this opportunity to ask yourself this question: What defines you?

Who are you?

Hometown, family environment, friends

What is the answer?

What determines who you are?

It took me a long time to realize who I am

For a long time, I thought that all that defined me was my physical appearance, my skinny legs, my skinny arms, my ugly face.

i thought i was sick

In the morning, as I was getting ready for middle school, I looked at myself in the mirror and thought, "I wish I could rub this disease away."

My life would have been easier if I could have rubbed it off.

I wouldn't have had to buy clothes with kid characters on them like all the other kids in my class. I just wanted to be cool like everyone else.

So when I woke up in the morning and I looked in the mirror, I wished, prayed, hoped, I did everything I could, and I said, "This is too much."

I hope so every morning, and I'm disappointed every morning

I have had incredible support from the people around me. They never felt sorry for me. They supported me when I was sad, they laughed with me when I was happy. They taught me something.

Like all of you, my life was in my hands.

I'm in the driver's seat, I'm the one who decides where I'm going

You're in the driver's seat, you're the one who decides where you're going. It's up to you to take the good road or the bad road.

You decide what defines your existence

What is it that defines who I am? It was very difficult to figure out the answer. I was frustrated and restless.

When I was in high school, unfortunately, I found a video uploaded that mocked me as "the ugliest woman in the world."

That eight-second silent video had more than four million views and thousands of comments, including, "Lizzie, please, please, please, shoot yourself for the sake of the world."

What if a stranger said this to you? please think about it

I cried, but somehow I was blown away, and I thought I should look back, and I thought, "Let's just leave it alone."

I began to realize that life was in my hands

It was up to me to make it very good or very bad out of this situation.

With a sense of gratitude, I opened my eyes and decided to decide how blessed I was and how that defined me.

I can't see in one eye, but I can see in the other

You may be prone to illness, but your hair is so beautiful

(laughs) (Audience: So pretty!)

thank you

Everyone there is in good spirits

(Laughter) (Lizzy Laughter) I forgot what to say.

(Laughter) Well, where did you come from?

(audience) Hair!

hair! yes hair yes thank you

So it's up to you to decide whether to be happy or to stay angry.

Let the people who told me to burn myself decide about me?

No way! I decide by my goals, my successes, my achievements, not by my looks, not by the fact that I'm blind, or by the fact that I have some kind of unexplained disease.

I told myself that I would do whatever it took to make myself better, because I thought I would get my back. To the people who teased me, who bullied me, who said I was ugly, who said I was a monster.

When people say negative things to me, I take advantage of them and use them as ladders to climb to my goal.

that's how i've been

My goals were to become an inspiring speaker, to write a book, to graduate from college, to have a family and a career.

Eight years later, I'm in the process of giving an inspiring story to you all.

first goal achieved

I'm writing a book, and I'm submitting my third manuscript in a few weeks.

(Applause) And I just finished my dream of graduating from college.

(Cheers and applause) I got my degree from Texas State University, San Marcos, majoring in communications and minoring in English.

While I was in school, I thought I should somehow make use of the real experience that only I had, which the professors had no experience with.

Finally, my goal is to have my own family and career.

It's going to take me a little longer to have a family, but I think I'm doing pretty well with my career. When I thought I wanted to be a public speaker, as soon as I got home, I opened my laptop and searched "how to become a public speaker."

(Laughter) I'm not kidding.

I did everything I could really do.

Fueled by their denial, my fire kept burning.

I'm going to use it. I'm going to turn my negativity into power. I'm going to use it to make my life better.

Now, one last thing I want you to ask yourself again.

What defines your existence?

Remember, courage starts here

thank you

(applause)

I've seen a lot of sad news lately, and I've been thinking a lot about "self-love" -- loving yourself.

We have been taught to love others as one of our values, but I think we haven't talked about loving ourselves very proactively.

why

Maybe it's because I've always thought that I'm cute because it's self-evident and I don't need to go out of my way to tell you to love yourself again.

humans are selfish

I want to do whatever I want

But everything is going well, so if you ask me if I can love myself like that

maybe a little different

If anything, the reason it's hard to talk about self-love is probably because it feels like narcissism, and it's disgusting.

If someone looked in the mirror and said, "I really like me," or "Don't bother me for a minute."

it's not about me

If there are people like that, I feel like I should just keep looking in the mirror forever.

I'm not saying that it should be

But life can be tough

It would be nice if my life ended happily

Depending on the situation, many people may say, "I hate you," or "I don't want you in this world."

In such a painful situation, at the very end, I thought, somewhere, humans have to love themselves as their own responsibility, with the intention of taking care of themselves.

When everyone says, "I hate you," and the moment we say, "Yes, actually, I hate myself, too," I think we end up hating living like that.

I myself have felt this kind of need several times in my life.

I don't know what will happen in my life in the future, so it may happen again that I have to love myself with the intention of taking care of myself.

It would be nice if that didn't happen and my life ended happy

It's just that I didn't know myself very well for a long time.

When I do good things and am appreciated and appreciated by people, I think I'm a good person at heart.

There was also a place where I felt a little relieved

On the other hand, when I've hurt someone badly or made them angry, I've been very disappointed in myself, and I've wondered if I'm inherently ruthless.

Loving yourself may actually be harder than loving anyone else, because we know so much.

Think about what you've done in the past I've done this, I've done that

I may have done good things, but I also remember a lot of bad things.

Can I really say that I love myself

It may require some fundamental change in mindset.

I've had many different versions of myself - I think I was a good version of myself at that time, or I was a bad version of myself Think back on yourself

I started by accepting that it was all about me for the time being.

I wonder if I'm actually a good guy at heart No, I'm basically cold-hearted

I started by thinking that it was all about me, and then I wondered why I, who was so alone, could change.

In the end, in interpersonal relationships, it depends on the person and the place.

And when I'm talking to my elderly grandmother at home, I feel very at home and relaxed.

When I'm talking to someone I work with, I sometimes say difficult things with a serious face.

When I'm in front of someone I dislike, it makes my guts boil.

I try not to meet him as much as possible.

Anyway, each of us is quite different

And while it may be very difficult to love yourself in general, you may actually be able to say that you love yourself when you're with someone else.

When I'm with that bastard, I become something I don't like.

It's not bad

Maybe it's not that hard

think about love

Let's say there are two women, both of whom think I'm good.

If you go on a date with a certain person first and have dinner together,

It was so much fun, one after another, you could tell funny jokes, and the reactions on the other side were good, and you'd naturally smile, and before you knew it, it was time

Let's say you rushed to the last train in a hurry and thought it was a good day.

I like the other side, but when I actually go on a date, I can't say anything very interesting.

If I let my guard down a bit, it becomes a scene

I feel like I'm becoming a very dull person

I thought I'd go to the second house until late, but at about the first, I said, "See you later," and the date ended.

Which woman would you like to see again? Naturally, I would like to see the former woman again.

Maybe it's because I like the other person, but it's because I like myself when I'm with that person.

Because I feel joy in myself and I feel worth living in living that self.

Of course, this definition is not wrong, but what I would like to add is that love is more about being able to love yourself because of someone else.

I would like to think in that way

In front of him, I would go all in. I would be able to relax and be honest, and I would be able to reveal many things.In front of other people, I would never be able to

Unfortunately, human relationships can come to an end.

If we quarrel or break up

You may even die

The sadness of losing someone, of course, I can't hear that person's voice, and I can't embrace that person.

The only time I could be that honest was in front of that person

How can you do such a stupid thing and do such a stupid thing-

I was only in front of that person Now that that person is gone I can no longer live the person I used to love

Isn't that the sadness of parting

The reverse is of course also true

When someone says, "I love you," I get ecstatic.

But if someone confesses, "I love myself when I'm with you, because of you," or, "I like myself better when I'm with you than when I'm with someone else," I think it's something that touches my heart even more.

There is something moving and joyful about the fact that one's own existence affirms the existence of others in this way.

Every time a human being finds something they like, they probably build a foothold for living.

When you live surrounded by a lot of people, you feel like you can't live if you're not loved by tens of percent of them.In the classroom, in the company.

But if you count the number of things you like, you may not need dozens of them.

If there are two or three parts of me that I really like, I can use that as a foothold to live on.

Five or six might be enough

Do you think you only have three friends in the classroom, or do you think there are three people who make you fall in love with them?

this is a different way of thinking

Loving yourself doesn't mean that you look in the mirror and say, "I love you," but that if you can love yourself because of someone else, you can love yourself through others.

I think that's probably the gateway to loving yourself.

And that's why we still love others as irreplaceable beings.

that's all

I am an artist

being an artist is the best job in the world

I feel so sorry for all of you who have spent your lives exploring new galaxies, and who have to save humanity from global warming.

(Laughter) But being an artist is also a daunting task.

This is how I spend my days from 9 to 6

(Laughter) I even started a side business where I just complained about the struggles of the creative process.

(Laughter) But today isn't the problem for me.

I would like to talk about what is useful

It just means that you're proficient in a language that you don't even realize is a language.

it's the language of images

It takes a lot of intellectual effort to decipher images like this.

Even though no one taught me, everyone understands

college, shopping, music

Language is persuasive when it can convey complex concepts in a very simple and efficient way.

It's a diagram that represents exactly the same concept as what you're saying now.

But when I look at a mortarboard, for example, I realize that it doesn't represent what you wear on your head when you're handed your diploma, but the whole concept of college.

Now, painting can not only convey an image, but it can also appeal to an emotion.

For example, let's say you see this in a strange land.

You will surely feel happy and relieved

(Laughter) Or maybe it's a little bit of anxiety, or maybe it's outright panic.

(Laughter) Maybe happy peace and quiet.

(Laughter) But images, of course, aren't just graphic icons.

For example, if I wanted to tell a story about conflict in modern society, I would start with two elbows on an airplane fighting over the only armrest in each of the two seats.

What's interesting is that there's a universal law to this, that armrest fights are over in 30 seconds, and once decided, they're yours for the rest of the flight.

(Laughter) Now, there are a lot of things like this on commercial airline flights.

If I were to describe the concept of discomfort, this picture of a neck pillow would be a perfect fit.

It's designed for comfort, but -- (Laughter) it's not working.

(Laughter) That's why I don't sleep on planes.

Sometimes I go into a painful coma,

When you wake up from that, you have a very bad taste in your mouth.

It tastes so bad that I can't describe it in words, but I can paint it.

(Laughter) Actually, I like to sleep.

And when I sleep, I like to co-sleep

I've been co-sleeping for nearly 20 years until I'm almost in the professional realm, but I still can't figure out what to do with my lower arm.

(Laughter) (Applause) And the only thing that makes sleeping more complicated than sleeping on an airplane is when you have young children.

Comes to bed around 4 in the morning and makes a false excuse, "I had a scary dream."

(Laughter) Of course, it's my child, so I'll feel sorry for him and put him in bed.

I will admit that at first it was very cute and warm and cozy.

As soon as I fall asleep again, somehow -- (Laughter) it starts spinning.

(Laughter) Let's call it helicopter mode.

(Laughter) Now, the stronger the impression that is imprinted on a person's consciousness, the less information is needed to make an emotional impact.

(Laughs) This kind of image is possible

Because we, as readers, are very good at filling in the blanks.

There's this idea of ​​using white space in painting.

Instead of drawing the object itself, you draw the space around it.

In this picture, the contents of the bowl are empty.

The black ink encourages the brain to project the food onto the blank space.

What you see here now is not an owl in flight.

It's actually standing on top of a silly picture -- two AA batteries -- that's driving a desk lamp up and down, bringing it to life.

(Laughter) Images really only exist in your head.

What is the amount of information required to create such an image?

My goal as an artist is to make it as small as possible.

The simplicity that I pursue is such that if I remove even one more element, the whole concept of the painting ceases to exist.

So, as an artist, my personal favorite technique is abstraction.

I came up with a mechanism that I named the "abstraction ruler" and it works like this:

First, the symbol. Anything, but a heart and an arrow, I think most people would interpret as a symbol of love. I'm an artist, so I can draw this as realistically or as abstractly as I want.

If you make it too realistic, you're just going to offend people.

(Laughter) If you go too far in the opposite direction, if you abstract too much, nobody knows what you're looking at.

So we have to find the optimal degree in this, and in this case it's somewhere in the middle.

Now, simplifying an image allows for a lot of different associations.

It allows us to tell the story in a completely new way.

(Laughter) What I like to do is collect images from very different cultures and bring them together.

(Laughter) You can play with it more if you choose bolder ingredients.

But of course, if you overdo it, you'll end up with blurry work that some people won't be able to keep up with.

As a designer, it's imperative that you understand the visual and cultural reading comprehension of your audience.

This image is about the Olympic Games in Athens, but I made it with the assumption that readers of "The New Yorker" should have a vague understanding of Greek art.

Otherwise this image will not be understood

But for those of you who know me, there might be some small details, like the pattern of beer cans on the bottom of the vase.

(Laughter) I've argued many times with magazine editors who are good at words, and they underestimate the power that you, the reader, have to take the leap from picture to understanding.

Also, the only thing that annoys me is that they try to make me use something that looks like a safe, worn-out, run-of-the-mill visual.

See, when a businessman climbs a ladder, the ladder moves and turns into a graph of the stock market.

(Laughter) If any of you are in charge of editing, let me tell you one thing.

Every time a picture like this is published, a baby panda dies.

(Laughter) It's true.

(Laughter) (Applause) How do you know when it's okay to use mundane visuals and when it's not?

it's a difficult one

it really depends

When the earthquake and tsunami happened in Japan in 2011, I was thinking about what to do with the cover.

We looked at a variety of classic symbols, the Japanese flag, and one of the greatest paintings of all time, Hokusai's "The Great Wave off Kanagawa."

But things have changed, and the Fukushima nuclear problem has gotten out of hand.

I remember watching on TV the workers in protective gear walking through the site, and what struck me was the silence and serenity of the scene.

So I wanted to create a silent catastrophe imagery.

And here's what I came up with

(Applause) Thank you.

(Applause) I want you, dear reader, to have a 'wow' experience.

But unfortunately, I didn't have the same experience when I was making it.

When I'm sitting at my desk, I don't have that kind of "light bulb popping up over my head" kind of thing.

In reality, it's a slow and gritty process of iterating design changes, and if you're lucky, you'll come up with a good idea.

One day, I was on a train trying to decipher the schematic laws of water droplets on windows.

I finally realized, "Oh, the blurry background is upside down in the water droplets, and it's crystal clear."

This is funny! I had no idea how to use it.

Then I went back to New York and painted a picture of people stuck in traffic on the Brooklyn Bridge.

It's very disgusting, but it's also kind of poetic.

Only later did I realize that I could combine these two ideas and express them like this.

What I'm aiming for is not to show a realistic scene,

It's probably like poetry, to make you realize that because I just unearthed an image that you already have, you've always had this image.

But like poetry, this is a very delicate task, neither efficient nor quantifiable.

Perhaps the most important skill an artist has is empathy.

Without technology and (Laughter) creativity -- (Laughter) thank you -- I can't think of an image like this.

But then you have to take a step back and look at your work from the reader's point of view.

I've tried to be a good artist by being a good observer.

That's why I started a personal exercise called "Sunday Sketching," where I used random objects I found around the house on Sundays to try and come up with ideas that had nothing to do with their original purpose.

I usually don't come up with anything for a long time.

The only trick to finally coming up with an idea is to look inside your head, go through all the images you've stored up, and see if there's something that sticks out.

If I get the hang of it, I use ink to connect a few lines to capture this flash of inspiration.

The big lesson from that is that miracles themselves don't happen on paper.

it happens in the viewer's head

It's when your expectations and knowledge meet the intentions of my work.

Your interaction with images -- your ability to understand them, to question them, to feel frustration, boredom, and inspiration -- is as important as my artistic contributions.

Because that's what transforms the message of your work into a creative dialogue.

Your image reading skills are not only amazing, they're what makes my art possible.

Therefore I am very grateful to all of you

(Applause) (Cheers) Thank you.

(applause)

When I was a little girl, I always envisioned that one day I would run away.

From the age of six, I had a bag full of clothes and canned food hidden in the back of my closet.

There was a deep impatience inside of me, and an underlying fear of falling prey to the boring, routine life.

So in many of my childhood memories, while hunting for berries, I meet a lot of unconventional people of all kinds living on the streets in a tangled daydream beyond the boundaries.

Years later, many of the adventures I dreamed of as a child -- traveling and spinning the paths of others rather than my own -- became a reality through my work as a documentary photographer.

But nothing seems more like a childhood dream than living with fellow wanderers across America and documenting their lives.

This is a different kind of dream than the American Dream, a wandering dream, where young vagabonds, travelers, hitchhikers, vagabonds and prostitutes live.

In many people's minds, the Wanderer is a product of the past.

The word "vagrants" conjures up images of old black-and-white photographs of old, battered coal-stained men with their legs dangling out of cargo containers. But these photographs, in color, depict a ferociously surviving, creative and free community that surrounds the nation, looking at the other side of America, which no one cares about.

Like their predecessors, modern nomads travel across America on railroad tracks and asphalt roads.

By day, they hop on freight trains, stick out their thumbs, and zip down highways with truck drivers and mothers busy with their children's extracurricular activities.

At night I sleep under the stars It's crammed with dogs, cats and pet mice

Some choose to live on the streets, trade materialism, conventional jobs, and a college degree for a ghostly adventure.

And then there's the people who haven't been given a chance to climb up from the bottom of society, the foster home defectors, the teenage boys and girls who have run away from abusive and overly rigid homes.

Those who travel through tales that are seen by those around them as deprivation and financial failure see their existence through the glimmer of liberation and freedom.

They would rather live on the surplus from a wasteful consumer society than toil for the unrealistic chance of achieving the classic American dream.

They're piggybacking on the fact that 40 percent of all food in the United States is edible enough to be discarded in large bins and wastebaskets, and they're eating it.

They sacrifice material comforts for their inner creative exploration, but instead use the space and time they have to dream, read books, play music, and enjoy art and writing.

But far from being great, this life has a messy side.

No one can erase the evil inside just by going out into the street.

Addiction is real, the elements are real, freight trains run them over, and anyone who lives on the street can be cracked down by brutal laws that criminalize their existence.

I don't think many of you here know that in many American cities, it's now illegal to squat on the sidewalk, wrap yourself in blankets, sleep in your own car, or feed strangers.

I know about these laws because many of my friends and travelers have been thrown in jail or received subpoenas for their involvement in these crimes.

Many of you may wonder why we choose to live this way: scavenge food from garbage cans, sleep under bridges, and juggle short-term jobs at the mercy of discriminatory laws.

The answers to such questions are as varied as the reasons that drive people to the streets, but travelers often answer with one word: freedom.

Until we can all live in a society where human dignity is guaranteed, where we work not only to survive but to live better, there will be those who seek this open road as a way of escape, as a way of liberation, and of course -- as a beacon of rebellion.

thank you

(applause)

Well, I thought, "Let's talk about death."

Today is a passionate day,

it's not really about death

Death is inevitable and scary, but what I really want to talk about is just being fascinated by the legacy people leave behind when they die.

that's what i want to talk about

Art Bukwald left his legacy of his humor in a video that appeared shortly after his death saying "Hi! I'm Art Bukwald. I just died."

And Mike, whom I met in the Galapagos on a trip I gave at TED, left his notes in cyberspace on his long journey through cancer.

Then my father left me a legacy of handwriting through handwritten letters and notebooks.

During the last two years of his life, when he was ill, he filled a notebook full of his feelings for me.

He modeled my life by citing my strengths and weaknesses, gentlemanly suggestions for improvement, and concrete events.

After his death, I realized that I had no one to write to me anymore.

Handwriting is a dying art

I do everything by email and type thinking, but why should I give up old habits for new things?

Why are letters and e-mails not exchanged in daily life?

I have a time that I would like to replace The time that I was too busy to sit by my father and talk to him, I would like to replace it with just one hug.

but it was too late

Yet when I take out a letter from my father and read it, when the paper that his hand touched is in my hand, I feel connected to him.

Perhaps we all need to leave a valuable legacy for our children. not monetary

Something of personal touch, like an autograph book or a soul-searching letter

If even a small fraction of this powerful TED crowd could buy clean paper -- John, you can even use recycled paper -- and inspire them to write letters to their loved ones, then maybe we could start a revolution in sending kids to calligraphy classes.

Now what shall I leave my son?

I'm collecting autograph books and some in this crowd I'm chasing CDs too, Tracy

I plan to publish my own notebook

Witnessing my father's body engulfed in fire, I sat by his cremation and wrote

I don't know how I'm going to do it, but I made a note of his thoughts and mine, and I vowed to leave it to my son.

I would like to finish with a poem I wrote at my father's cremation.

Linguists, please excuse my grammar, because I haven't reviewed it in ten years.

I brought it out for the first time to come here

"The picture in my forehead, the ashes in the jar, the boundless energy trapped in the jar, forcing me to face reality, forcing me to grow.

I can hear you I know you want me to stay strong But now I'm sucked up and surrounded by a growing water of emotion I can't breathe, longing to cleanse my soul and seek a foothold to fight once more in style Just as you taught me

In the vortex of despair Your encouraging whisper lifts me to the shores of sanity To live again and love."

thank you

(music) ♪ All is told in the gospel ♪ ♪ The Magdalene visits the grave ♪ ♪ Her mind is disturbed ♪ ♪ When she finds the empty tomb ♪ ♪ The straw mat is rolled up ♪ ♪ The corpse is gone ♪ ♪ There was a dark and cold grave ♪ ♪ When the girl approaches the door ♪ ♪ He finds a figure ♪ ♪ A lonely figure has a halo ♪ ♪ He drifts over the hills of Golgotha ​​♪ ♪ At the speed of an almighty being ♪ ♪ But my daughter may still catch up ♪ ♪ Lord tell me where are you going ♪ ♪ Why are you in such a hurry? ♪ ♪ Girl, don't disturb me ♪ ♪ Time is running out ♪ ♪ The ship will be launched tomorrow at noon ♪ ♪ I must get there before the sun rises ♪ ♪ I can't be late ♪ ♪ The young men are waiting for me ♪ ♪ What else would God bring me back to life? ♪ ♪ ♪ ♪ Nothing can hold me back ♪ ♪ ♪ ♪ ♪ Through the fangs of the storm ♪ ♪ In the midst of the gale ♪ ♪ Angels, protect me ♪ ♪ Even if all else perishes ♪ ♪ And the last ship departs ♪ ♪ The sound of the chains crashing ♪ ♪ The creaking of the sleepers ♪ ♪ I hear the sound of the end of the world ♪ ♪ The towering iron steps out to sea ♪ ♪ And the last ship departs ♪ Me was born and raised in a small town on the northeast coast of England, hidden in the shadow of a shipyard.

One of my earliest memories as a child was of a giant ship moored at the end of the road in front of my house, blocking out even the sun for most of the year.

When I was a kid, I used to see thousands of men walk down that hill every morning to the shipyards.

And I saw the same men heading home again at night.

I have to say that a shipyard isn't the best place to live next door or work there.

Shipyards are noisy, dangerous, toxic and dangerous places for health and safety.

And yet, the people who worked in the shipyards, both men and women, took an extraordinary amount of pride in their work.

Some of the largest hulls ever built on earth were built at the dead end of the street in front of my house.

My grandfather was a shipbuilder, and when I was a kid, there were only a few other jobs in town, and I wondered, with a little trepidation, if that was going to be my destiny one day.

I had a firm will to never want that to happen.

I had some dreams, but they were never real, but when I was eight years old, I was given a guitar.

It was an old, rusty, rusty guitar with five missing strings, but I soon learned to play it, and found that I had found a friend for life in the guitar.

They say that if you wish hard enough, your dreams will come true, but was that really the case?

How I've been extraordinarily lucky—this was my dream anyway

I thought that if I left this town and set sail like that ship, I would never return.

You dream of being a singer-songwriter, you sing your songs to the world, you get rich money, you become famous, you marry a beautiful woman, you have children, you start a family, you buy a big house in the country, you own a dog, you make wine, you have rooms adorned with Grammy Awards, platinum discs and so much more.

It seems to have worked for now, right? (Laughter) And then one day, I couldn't think of any more songs. I've had occasional creative blockages, but they were short-lived, but this time they were chronic.

Day after day, my mind is blank and I can't think of anything

Days turned into weeks, then months, and soon months turned into years, but the effort was in vain and no song came to mind.

Soon thoughts like this start to come to mind

What kind of blasphemy have you done that the gods forsake you?

Has the talent for composing been taken away as easily as it was given?

Maybe you have a more serious mental problem.

Indeed, creation has always been an act of Faust's pact with the devil.

I exposed my inner self, and in exchange for that, I completed a song.I turned my very personal feelings into a song, entertained people, and was analyzed in various ways by people.

But looking at all the work I've done so far, I've wondered if my best work wasn't about me, it was about someone else.

Perhaps my masterpieces weren't born when I stepped away from my ego and stopped telling my own story, and when I started telling someone else's story -- someone who had no voice -- and I thought about them empathetically and saw the world through their eyes.

Write what you know, that's what they say

What should I write when I can't write about myself?

It's ironic, but the scenery of the place where I desperately fled and the hometown I abandoned as an exile was exactly the scenery and the hometown I had to return to in search of the goddess of music I had lost sight of.

And when I decided to honor my home community and tell its story, a song immediately springs up.

I couldn't help but burst out from the depths of my body. Ideas, characters, and lines, poems, couplets, flooded in torrents.

The first thing I wrote was a list of names of people I knew, and they eventually became characters in some sort of 3-D drama, talking about who they were and what they were doing, their dreams and their fears about the future.

This is Jackie White's song

It's the song of the shipyard master

My name is Jackie White I'm the master of the shipyards No one on the quay can challenge Jackie

I'm hard as an iron plate I'm sorry if I'm late When I have to push the ship into the spring tide

Trust me you'll go to heaven when you die Keep your shifts in order And I'll ask for your support till the end At heaven's gate When St. Peter asks why you're late Just say you were building a ship

For Her Majesty I've built battleships and cruisers And then for shipping tycoons I've built all sorts of ships From supertankers I've built some of the biggest ships Of all the things the world has seen- ♪The only life worth living is in the shipyard ♪Steel in the yard Iron in the soul ♪That's all there is to building a ship ♪From just the hull ♪If the shipyards are sold ♪We have nowhere to go. ♪ ♪ The only life worth living is in a shipyard ♪ (Applause) When you decide to write about someone else instead of yourself, when you decide to write about someone else instead of yourself, the irony is that sometimes you expose yourself more than you realize.

The song is called "Dead Man's Boots," and that phrase describes how hard it is to get a job.

Or when the father somehow found an apprenticeship for his 15-year-old son.

And sometimes a father's love is misinterpreted as oppressive, and conversely, a son's dreams are seen as absurd fiction.

(Music) ♪ Work shoes in hand ♪ ♪ They'll fit your son's feet soon ♪ ♪ I'll give you these ♪ ♪ You should try them on ♪ ♪ I'd love to see ♪ ♪ Someday you'll wear these boots ♪ ♪ ♪ I'll join the ranks of the men ♪ ♪ It's time to put down your father's boots and go to the river ♪ ♪ My father said, ``It's time to die, son. These dead man's boots are old and warped ♪ ♪ When a new man needs a job and a place to live ♪ ♪ It's time for a man to put down roots ♪ ♪ Put on your father's boots and head for the river ♪ ♪ I said, ``Why should I do that?'' ♪ ``Why should I nod?'' ♪ I've never been soaked ♪ ♪ Until then ♪ ♪ I'll decide my own life and get out of here ♪ ♪ When I come of age in September ♪ ♪ These dead man's boots will be thrown away ♪ ♪ It doesn't matter where I go ♪ All I have left are two half pennies ♪ ♪ A broken and dirty pot ♪ ♪ You wished for me the same miserable life ♪ ♪ Was that your last wish? ♪ My father said, "What are you going to do with your life?" ♪ ♪ ♪ I said, ``Anything but this!'' No severance pay or a small amount of money From my father whose life is over ♪ Listen carefully I'm not like my father

Every time a big ship is built, a dignitary from London is invited to board the train and make a speech, and they'll break a bottle of champagne on the bow, and on the slipway the ship will sail to the river and to the sea.

Occasionally someone in the royal family is called in for a really important ship - the Duke of Edinburgh or Princess Anne or someone -

As we all know, not too long ago, the British royal family was believed to have magical healing powers.

A sick child would be offered out of the crowd to touch the cloaks of kings and queens so that they would be cured of their terrible illness.

It was an obsolete custom, but the city was still in an uproar.

The ship was launched on Saturday, my mother dressed me up like a Sunday mass

i was puffing

All the kids out in the street waving the British flag And a bunch of motorcycles up on the hill

In the middle of it is a big black Rolls Royce

Her Majesty the Queen is on board

this is a big deal

The procession marches through the streets in front of my house in a majestic way, and when they come near my house, I start waving the flag with vigor, and I see Her Majesty the Queen.

I think my eyes met with Her Majesty the Queen

His Majesty looks at me, waves and smiles.

I wave the flag more vigorously

We share a moment Me and Her Majesty

the queen looks at me

and go away

yeah i didn't get cured of any disease

on the contrary

I'm overwhelmed with fever

I was invaded by an idea

I don't belong here

I don't want to live in that house

I don't want to spend the rest of my life in that shipyard.

I want to drive that car (laughs) I want to live a glamorous life

I want to live a life bigger than this city

I want a life that is not ordinary

because it's my right

It's my right as it's the Queen's right

And now I'm here at TED to tell this story, and I think it's also good to tell this obvious one: that there are symbiotic, intrinsic connections between storytelling and community, between community and art, between community and technology, and between community and economics.

I believe that any abstract economic theory that denies the need for community and its economic contribution is shortsighted, cruel, and untenable.

(Applause) The truth is -- whether you're a rock star, a shipyard welder, an Upper Amazon tribe man, or an English queen -- after all, we're all destined for the same thing.

♪The servants are upset♪ ♪The Queen has taken a taxi to the station♪ ♪The porter is surprised to find that the Queen's luggage is missing♪ ♪Hurriedly puts the Queen and three corgis into the back of the carriage♪ ♪The train is full of all sorts of European aristocrats♪ ♪No one wants to get along♪ ♪ ♪ ``Where are they going? ♪ ♪ The porters argue ♪ ♪ 'Everybody's going to Newcastle, they can't be late ♪ ♪ When the tide is high there's a boat launch on the Tyne ♪ ♪ And they're all from all over the world' ♪ ♪ They didn't even buy a ticket ♪ ♪ Well, that's a small thing ♪ ♪ I don't have time to buy it, but I just have to do it ♪ ♪ If I don't get to the shipyard, I'm going to jail! ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ ♪ WHEN THE LAST SHIP LEAVES ♪ ♪ RINGS OF CHAINS clashing ♪ ♪ THE CRACK OF TIGHTS ♪ ♪ Wherever you are on earth, in the sky, under the sun ♪ ♪ When the last ship departs ♪ ♪ The sound of chains clashing ♪ ♪ The creak of the sleepers ♪ ♪ I hear the sound of the end of the world ♪ ♪ A towering mass of iron marches out to sea ♪ ♪ And the last ship is sailing ♪ Thank you for your attention.

Thank you. (Applause) Thank you.

If you know this song please sing it

(Music) (Applause) ♪ I'm just a drifter ♪ ♪ On a deserted island floating in the sea ♪ ♪ Another lonely day passes ♪ ♪ My own world ♪ ♪ I'm so lonely that I can't stand it ♪ ♪ Before I fall into despair, can someone help me ♪ Send an SOS to the world ♪ ♪ Send an SOS to the world ♪ ♪ Message in a bottle ♪ ♪ Message in a jar ♪ ♪ It's been a year ♪ ♪ I should have known from the beginning ♪ ♪ Only hope keeps me ♪ ♪ Only love can heal my life ♪ ♪ Love can hurt ♪ ♪ Send an SOS to the world ♪ ♪ Send an SOS to the world ♪ ♪ Can someone pick it up ♪ ♪ Can someone pick it up ♪ ♪ Message in a bottle ♪ ♪ Message in a jar ♪ ♪ Message in a jar ♪ ♪ Message in a jar ♪ ♪ I went out this morning ♪ ♪ I couldn't believe the sight ♪ 100 billion bottles ♪ ♪ They washed up on the shore ♪ ♪ I wasn't the only one lonely ♪ 100 billion castaways ♪ ♪ Looking for a place to go home ♪ Send an SOS to the world ♪ ♪ World ♪ Somebody pick me up ♪ ♪ Somebody pick me up ♪ ♪ Somebody pick me up ♪ ♪ Message in a jar ♪ ♪ Message in a jar ♪ ♪ Message in a jar ♪ ♪ Message in a jar ♪ Sing along from here Next part

it's easy let's sing together

here we go

♪ Let's send an SOS ♪ Let's sing

Audience: ♪Send SOS♪ Sting: ♪Send SOS♪ Audience: ♪Send SOS♪ Sting: ♪Send SOS♪ Audience: ♪Send SOS♪ Sting: ♪Send SOS♪ Audience: ♪Send SOS♪ Sting: ♪Send ♪Send SOS♪

(applause)

i saw a ufo once

I was about eight or nine years old, and I was playing in the street with some friends who were slightly older than me.

We stared at him for a few seconds, and then he went away with astonishing speed.

As a child, I was furious that the object defied the laws of physics.

We ran into the house and told the adults, but they didn't believe us, you don't believe us, do you?

Years later, I hit back, and one adult said to me, "I saw a flying saucer last night.

I had just gone out after a few drinks at the pub."

I interrupted him and said, "Let me explain what you saw."

(Laughter) Psychologists have proven that our brains don't always tell us the truth.

It's easy to fool yourself

I saw an object, what was it - did I see an extraterrestrial spacecraft, or did my brain misinterpret what I saw?

But ever since then, I've wondered, why don't we see flying saucers flying around?

At least why haven't we found life in the universe?

This is a difficult question, and I've been discussing it with dozens of experts in various fields for the last 30 years.

but there is no consensus

Since 1960, Frank Drake has been searching for signals from aliens, but so far without success.

Year after year, the unobserved and unproven evidence of alien activity only adds to the mystery, because it should have been found, right?

The universe was born about 13.8 billion years ago

If we were to describe the history of the universe as a year, humans would be born 12 minutes before midnight on December 31st.

The existence of Western civilization is a matter of seconds

Extraterrestrial civilizations may have begun during the summer of that year.

Imagine that a civilization that started in the summer has developed technology that is much more advanced than ours, and that it's based on common physics -- not wormholes, warp drives, or anything else -- but more advanced technology that TED praises.

Suppose that civilization could program a self-replicating probe to visit every planetary system in this galaxy.

If they had launched a spacecraft just after midnight one day in August, they could have taken over the galaxy before breakfast that same day.

Controlling other galaxies isn't much more difficult, it just takes longer.

A single civilization from millions of galaxies could have ruled our galaxy.

Sounds crazy, doesn't it?

Maybe so, but why aren't aliens taking visible actions -- placing asteroids around stars to capture sunlight, co-creating the Galactic Wikipedia, or yelling, "Here I am!"

where are they?

It's a mystery because we believe such civilizations exist, right?

There could be as many as a trillion planets in our galaxy - maybe more.

You don't need any special knowledge to think about this question.

And what I've noticed is that they often frame the idea that in order for a planet to have a communicative civilization, it has to overcome some barriers.

In their view, there are usually four walls.

Habitability - that's the first wall

It must be a terrestrial planet in the "Goldilocks zone," a planet where water exists as a liquid.

actually it exists

In 2016, astronomers found a planet within its habitable zone, and one that orbits Proxima Centauri, the closest star to Earth.The Breakthrough Starshot program will send a probe to this closest star.

We may become creatures that travel between the stars.

But some places are not habitable

If you get too close to a star, you'll get burned. If you get too far away from a star, you'll freeze.

Spontaneous generation - that life comes from non-life - that's the second wall.

The building blocks of life are not unique to Earth: amino acids have been found in comets, complex organic molecules in space dust clouds, and water in exoplanet systems.

The materials are out there in the universe. We just don't know how they combine to create life. There are probably worlds in which life doesn't occur.

The technological development of civilization is the third barrier.

Some say we already share this planet with extraterrestrial intelligent life.

A 2011 study found that elephants can work together to solve problems.

A 2010 study found that captive octopuses can distinguish between multiple humans.

In 2017, a study showed that the Great Glass can plan ahead -- it's a wonderfully intelligent creature -- but it can't plan a Breakthrough Starshot project.

Space travel is not the end goal of the evolution of life.

There will be planets where life forms don't put much effort into developing technology.

Communicating with stars in the far reaches of space - that's the fourth barrier.

Advanced civilizations may choose to explore the interior of their own stars rather than outer space, or they may do so at short distances rather than long distances.

Or maybe you don't want to risk encountering a neighbor who is more technologically advanced and potentially hostile.

There must be some civilizations that, for one reason or another, remain silent or make no effort to communicate with others.

You're right about the height of these barriers.

In my experience, most people conclude that there are thousands of civilizations in this galaxy when doing the math on paper.

But then again we are confronted with the mystery: where are they all? and

By definition, UFOs - including the ones I've seen - are unidentified.

We can't just assume they're spaceships.

But you can still have fun imagining the idea that aliens exist.

Some say that a civilization that was born in the summer ruled this galaxy and seeded the earth with life.

Some people say we live in a wildlife reserve in space, which is a zoo.

And some say - we live in a simulation

It's just that the programmers haven't made the aliens appear yet.

Most of my colleagues argue that E.T. exists and we should continue to search, and that makes sense.

the universe is vast

The signals are difficult to identify and are not yet observable for long periods of time.

Without a doubt, we'd be better off spending more time exploring.

That's how we understand our place in the universe.

This is an important issue that cannot be ignored

But there's also a clear answer: we're all alone.

we are alone in the universe

There may be a trillion planets in this galaxy

Humans are the only creatures that can think of this question. Can you believe that?

Well yeah, in this context, we don't know if 1 trillion is a big number.

Peter Ward and Don Brownlee came up with the rare earth hypothesis in 2000.

Recall those four barriers, which are used to estimate the number of civilizations.

They say there may be more

Consider a barrier

As geophysicist David Waltham recently put it,

I'm going to give you a pretty simplistic explanation of his wonderfully sophisticated argument.

We're able to live on Earth today because past life on Earth has been blessed with a good climate -- a climate that's varied but mostly warm -- for four billion years.

But long-term climate stability is unusual, because astronomical influences can change a planet's climate from frigid to scorching heat.

There are also clues to suggesting that it's due to the action of the moon, which is interesting because the most popular theory for the birth of the moon is that the planet Theia, about the size of Mars, collided with the proto-Earth.

Depending on the outcome of that collision, the system of the Earth and Moon could have been different than it is today.

The result was a large moon, giving the Earth both a constant axial tilt and a slow rotation.

Both factors influence the weather and are said to have moderated global climate change.

Great, right?

But Waltham suggests that if the moon had been just a few kilometers bigger, things would have been different.

The earth's axis will not be fixed and will move chaotically.

Rapid climate change will cause many things, and it will be a blow to life in complex systems.

The moon is just the right size. It's big, but it's not too big.

The moon orbits the planet, and both are within the habitable zone - this could also be a barrier.

I can imagine many more barriers

For example, billions of years ago, single-celled organisms emerged.

But perhaps the evolution of complex life was the result of a series of miraculous events.

When life on Earth became multicellular, had advanced genetic makeup, and was capable of interbreeding, new possibilities opened up: animals were born.

But perhaps life on many planets is destined to remain single-celled.

So, just for the sake of simplicity, I'd like to add four more barriers to the four barriers mentioned above, which are said to prevent us from developing into an interactive civilization.

Again, just for simplicity's sake, let's assume that each barrier has a 1 in 1,000 chance of getting through.

Of course, there may be other ways to overcome the barrier, and there may be more chances than 1 in 1,000.

Similarly, there are many other barriers that could be crossed with a one-in-a-million chance.

Think about what would happen in that situation

If there are 1 trillion planets in this galaxy, how many planets could have a civilization like ours capable of planning something like Breakthrough Starshot?

Habitability -- the right planets orbiting the right stars works out to one billion out of a trillion.

Stability - 1 million out of a billion will have good weather forever.

Life is born in 1,000 out of 1,000,000.

Only one in a thousand will evolve into complex life.

Only one planet in a thousand galaxies will evolve to use advanced tools.

To understand the universe, we need to develop the skills of science and mathematics, and that's only possible on one planet in a million galaxies.

To reach other planets, aliens would need to be social lifeforms, capable of discussing abstract concepts, and using complex grammars -- and that's only one planet in a billion galaxies.

We also have to avoid natural disasters, not only from within the star itself, but also from outer space.

A planet orbiting Proxima Centauri exploded last year due to a flare.

In the visible universe, only one planet in a trillion galaxies would satisfy this.

i think we are lonely

My colleagues who agree with this statement often think about certain barriers in front of us: biological terrorism, global warming, war.

The universe is silent because technology itself creates barriers to the development of truly advanced civilizations.

Feeling heavy, right?

I argue quite the opposite

I grew up watching "Star Trek," "Forbidden Planet," and I used to see UFOs.

But if you ask me, the silence of the universe is screaming, "We are lucky creatures."

we have overcome all barriers

We are the only species that has been able to overcome barriers, and we are the only ones who can decide our own destiny.

If we learn to appreciate how special our planet is, how important it is to cherish our home planet, how important it is to find other forms of life, and how lucky we are all to know that the universe exists, human civilization may be able to survive for some time to come.

All the wonderful things we imagined aliens might have done in the past may be our future.

thank you very much

(applause)

people talk about religion all the time

(Laughter) The subtitle of "God Is Not Great" by the late great C. Hitchens is "Religion Poisons All."

(Laughter) But last month in Time magazine, Rabbi David Wolpe, who has been called "America's Rabbi," tried to counterbalance that negative image by saying, "No social change can be made without organized religion."

These descriptions of good and bad have been around for a long time.

I've got one here, first century B.C. Lucretius, author of On the Nature of Things, said, "Tantum religio potuit suadere malorum ..." (Latin) I can't memorize it, but the point is to explain how religion encourages people to do evil things, and as an example, Agamemnon decided to offer his daughter Iphigenia on the sacrificial altar so that he could continue his march. I gave what I did

So the debate over religion has been going on for centuries, even millennia.

People often talk about religion -- things like "good," "bad," or "don't care."

The point I want to make today is very simple, and arguments like this are in some ways irrational, because there is no such thing as a religion in the first place.

Without religion there is neither good nor bad

You can't even be "indifferent"

If you're trying to claim that "things don't exist," the obvious way to prove that things that are supposed to exist doesn't exist is to give a definition of that thing and see if anything satisfies that definition.

I would like to start with this method

The natural definition of religion, if you look it up in a dictionary or think for yourself, is that it's about belief in a god or something sacred.

This definition can be found in many dictionaries, but it's also found in a book by Sir Edward Tyler, the first professor of anthropology at Oxford and one of the pioneers of modern anthropology.

In his book on primitive cultures, he says that the core of religion is "animism," the belief in spiritual powers and beings.

The first problem with this definition is found in Paul Beatty's recent novel, "Tough."

a man is talking to a rabbi

The rabbi says he doesn't believe in god

The man says, "Is there a rabbi who doesn't believe in God?"

The rabbi answers, "That's the great thing about being Jewish.

You don't have to believe in God, you just believe in being Jewish." (Laughter) Now, if this guy is a rabbi, and he's a Jewish rabbi, and if you have to believe in God to be devout, then you come to a conclusion that's hard to understand with common sense: if you can be a Jewish rabbi without believing in God, then Judaism isn't a religion.

I think this is counterintuitive thinking.

There is another argument against this view.

An Indian friend of mine, when he was very young, said to my grandfather, "I want to talk to you about religion," and he said, "You're too young.

Come back when you're a teenager,' he said.

So when I was a teenager, I went to my grandfather and said, "Maybe it's too late, I know I don't believe in God."

And his wise grandfather said, "So you're an atheist among Hindus."

his name is the dalai lama

He often jokes that he's one of the world's top atheists.

That's true, because his religion doesn't include belief in God.

Now, you might think, I'm just misdefining, so maybe I should come up with a different definition and test it against these examples so that I can explain atheistic Judaism, Hinduism, and Buddhism as forms of religion.

So the concept of religion comes into being is that we have a list of typical religions and their offshoots, and when we come across something new, like a religion, we ask ourselves which ones on the list it resembles.

don't you

But I don't think that's the only way we think about religion, which is to say, from our point of view, anything on that list should be a religion.

But why do we have this list?

What is going on? Why do we have this list?

I think the answer is very simple, and that's why it's so broad and so controversial.

A lot of people will disagree with me, but here's what I think, whether it's true or not, it gives you an idea of ​​what the list was like before it came out, and it helps you think about how the list might be useful.

The answer is that European explorers began sailing around the world around the time of Columbus.

They come from a Christian culture, so when they arrived in a new land, they found that there were people who didn't have a Christian faith, so they asked themselves, "What do they have in place of Christianity?"

That's why I created that list.

The list contains what non-Westerners had in place of Christianity.

But continuing to follow this path is problematic, because Christianity is an extremely unique tradition on the list.

The peculiarities of Christianity are all over the place, which are the result of what is peculiar to the history of Christianity, and what is at the heart of it, when we understand Christianity, what is at the heart of it, and what is the result of its peculiar history, is that this religion is extremely creed.

So it's a religion that cares a lot about whether people believe what's right.

The internal history of Christianity is primarily the history of killing, because they believed they were wrong.

This is a unique and peculiar history of Christianity, and it's not everywhere you've ever been on a list like this.

I think you have another problem

something very special happened

Something very special happened in the history of Christianity, which had been avoided before, but which is now very close to us, mainly in America. It was in the late 19th century.

Take the 18th century, for example. If you think about intellectual life before the late 19th century, everything you do and think about, whether it's in the physical world, in the human world, in the non-human natural world, or in morality, would have followed a set of religious or Christian assumptions.

For example, if you were to explain the natural world, you had to explain its relationship to the creation myth in the Christian, Jewish, and Islamic traditions, the content of the book of Genesis in the Pentateuch.

everything was shaped like this

But it was this change in the late 19th century that, for the first time, made people, like Darwin, truly pursue the intellectual career of a naturalist.

Darwin was concerned about the relationship between his claims and the truths of religion, but he was able to continue to study and write books on his subject without stating the relation to what religion was claiming.

When geologists in the first half of the 19th century made their theories about the history of the Earth, they had to explain what they agreed with, and what contradicted, the history presented in the Genesis account.

At the end of the 19th century, it was possible to write a geology book just to discuss the history of the Earth.

So there must have been a big change, the kind of intellectual division of labor that I'm talking about. And that kind of took hold, and by the end of the 19th century, there was a real intellectual division of labor in Europe, and a lot of research was going on, really involving even philosophy, and it wasn't bound by the idea that this kind of research should be consistent with the profound truths of religious tradition.

Imagine a late 19th-century resident of the world who, at the end of the 20th century, showed up in the society of Asante, my hometown of Ghana, with the question that gave birth to that list: "What is there instead of Christianity?"

That person will realize that there was someone who actually noticed

His name is Captain Rattray, an anthropologist sent by the British government who wrote about Asante religion.

this is soul disc

The British Museum has a lot of these

I could have told you an interesting history story about why there is so much stuff in my society in the British Museum, but I don't have time for that.

Anyway this is soul disc

What is Soul Disc?

The one who washes the soul of the king of Asante wears it around his neck.

what are their jobs? to wash the king's soul

It would take me a long time to explain exactly how the soul could be washed, but Rattray knew this was religion, because it had to do with the soul.

There are many more similar things and similar practices.

For example, every time we drank wine, more or less, we would do a "gift," pouring it on the ground and giving it to our ancestors.

My dad used to do this, every time he opened the whiskey -- which he would open a lot -- he would always take the lid off and put it on the ground a little bit, and he would offer it to Akroma Ampim, the founder of the family line, and Yao Antony, his great-uncle, while talking to him.

And finally, there's the big public ceremony.

Here's an early 19th-century sketch of a British army officer depicting such a ceremony. The ceremony was attended by the king. One of the most important jobs of the king, except for the kind of war he led, was to guard the tombs of his ancestors.

This is an important task, and the people believe that if the king neglects this task, everything will fall apart.

So the king was not only political, but, in Rattray's terms, religious.

To Rattray, all of this would have seemed like religion, but I would like to emphasize that if you look at their lives, they are always aware of their ancestors in everything they do.

Every morning when I have breakfast, I go out in front of my house and make offerings to the Nyami-Dua, the tree of God, outside.

In a world like this, religion and science have not yet separated.

Religion is not separate from the rest of our lives, and there's one thing, especially, that's essential to understanding this world. It's that science plays what Rattray would call religion in our society. They are always the same beings, they use the same words, they always speak to the same gods.

The great separation, the separation of religion and science, has not happened yet.

This may be historically unusual, but it's still true in most parts of the world today.

I recently had the opportunity to attend a wedding in a village of 200 people in northern Namibia, about 30 kilometers from the border with Angola.

everyone is modern

Oona Chaplin was there, as some of you know. A villager came up to her and said, "I saw you in Game of Thrones." People say it wasn't a parable.

I really thought that even if my mother was dead, she would still be near me.

So, in many places in the world today, the separation of science and religion is not happening, and as I said... this man worked for Chase and the World Bank.

They live in the same world as you, but where they live, religion plays a very different role.

So if you're one of those people who lump all religions together, think of it this way: there may not be one religion, there may not be any religion, so what those people say can't be right.

(applause)

At every stage of our lives, we make decisions that have a profound impact on the rest of our lives, but when it comes "afterwards," we're not always happy with our past decisions.

So young people remove a lot of the tattoos they had in their teens, a lot of them.

The people middle-aged and older people rush to divorce are the people they rushed to marry when they were young.

The things that older people are working hard to get rid of are the things that they worked hard to increase in middle age.

it's always the same pattern

As a psychologist, the question that fascinates me is this: Why do we make decisions that our future selves will regret?

I think one of the reasons, as I'll explain, is that we have a fundamental misconception about the power of time.

We all know that change slows down as life progresses. Children seem to change in minutes, but parents change in years.

At this strange crossroads in life, when does change suddenly go from breakneck to slow?

Out of your teens? since middle age?

old age? The answer is, surprisingly, for most people, it's now. It's always now.

What I want to convince you is that we're all under the constant illusion that our past is over, that our history is over, that we've been meant to be forever, that we've just recently become who we really are, and that we're going to be who we are for the rest of our lives.

There is data to support this claim

It's a study that looks at how people's values ​​change over time: joy, success, integrity.

three values

You have all three, and you know that as you grow, as you get older, the balance of all three changes.

why is that

I asked thousands of people

Half of the people were asked to predict how much their values ​​would change in the next 10 years, and the other half were asked how much their values ​​would change in the last 10 years.

This allowed us to do some really interesting analyzes, like 18-year-olds' predictions compared to 28-year-olds' reflections, and we were able to do cross-age analysis.

Here is the result

The first thing we were right about was that change slowed down with age, but the wrong thing was that the pace wasn't as slow as we thought.

The data show that everyone between the ages of 18 and 68 greatly underestimates the change they'll experience over the next 10 years.

I call this the "end of history illusion."

To show the magnitude of this result, let's put the two together, and you'll find that the changes predicted by 18-year-olds are the same as those reported by 50-year-olds.

It's not just about values, it's about anything else.

For example personality

As you probably know, modern psychologists discuss personality traits in terms of five factors: emotional instability, openness, agreeableness, extroversion, and industriousness.

Again, we asked how much we expect to change in the next 10 years, and how much we've changed in the last 10 years.

It's not just transient things like values ​​and personality.

You can ask about your likes and dislikes, your basic preferences.

For example, ask them to name their best friends, their favorite vacation activities, their favorite hobbies, their favorite music.

you can answer

The question for half of the people was, "Do you think this will change in the next 10 years?"

The question to the other half was, "Has it changed in the last 10 years?"

And the results, as you've seen twice, are the same. The predictions are that your current friends will be your friends for the next 10 years, and your current vacation plans will be the same 10 years from now.

is there a problem

Is it just a miscalculation that has no effect?

no it's a big deal i'll give you some reasons why

This confuses our decision-making at critical moments.

Think about the musicians you like now and the musicians you liked 10 years ago.

I have included my example on the screen

Now, I asked people, and when I asked them how much their favorite musicians would pay today for a concert in 10 years' time, the average price for a ticket was $129.

And when I asked how much I would pay to see someone I liked 10 years ago play today, the answer was only $80.

In theory, they should be worth the same amount, but we overestimate invariance and overpay for the possibility of meeting our current preferences.

It's not clear why this happens, but it probably has to do with the relative difference between the ease of recall and the difficulty of imagining.

We can remember who we were 10 years ago, but it's hard to imagine who we are going to be, and we mistakenly think that the hard to imagine won't happen.

Unfortunately, when you say "I can't imagine," you're talking about a person's lack of imagination.

So time is a powerful thing.

change our tastes

renew your values

will change your personality

It is only later that we acknowledge this fact.

Only in retrospect do you realize how much things have changed in 10 years.

For most people, now is a magical time.

It's a turning point in the flow of time

It's time to finally become who you really are

Humans are incomplete, but they mistakenly think they are complete.

You are as fleeting and ephemeral as you were in the past.

The only constant in life is change

thank you

(applause)

I read poetry all the time, I often write about it, and I break it down to see how it works, because I'm a word person.

I see the world most fully in words rather than pictures and numbers, and when I have a new experience or feeling, I get a little frustrated until I can put it into words.

i think i've been like this all along

Even now, when I was a kid, I was obsessed with science fiction.

Poems by Andrew Marvell, Matthew Arnold, Emily Dickinson, William Butler Yeats, were quoted in science fiction, and I loved the feel of them, so I read on from there and read on to the octagons, the mid-pauses, the straddles, all the technical stuff that poetry lovers read, because poetry has already made me happier and sadder and more alive.

I wanted to know how and why, so I became a poetry critic.

Now, poetry, like music or computer programming, is not dedicated to one purpose.

In Greek, poetry means "constructed", and poetry is a set of techniques, a way of producing patterns that translate emotions.

The more techniques you know, the more you can create, and the more patterns you can recognize in your favorite things.

That being said, poetry seems to be particularly good at certain things.

For example - we will die one day

Poetry allows us to accept that fact.

Poetry is made of words, only words

Poetry's character is like the intense personality of an individual that distinguishes people from each other.

Poetry is easy to share and easy to convey. When you read poetry, it feels like someone is speaking to you, maybe someone far away, someone in your imagination, someone dead.

That's exactly why we can turn to poetry when we want to remember something or someone, when we want to celebrate, when we want to look beyond death, when we want to say goodbye.

As the poet Frank O'Hara said, "If you don't need poetry, that's all."

Poetry gives me a zest for life, and to show you why, here are a few poems that respond to the fact that we live in one culture, one time, one place, and no other way to live.

Well this is one of the first poems I ever learned

Both children and adults understand

"From far away From morning to evening Twelve winds blow in the sky - From you to me A part of my life Come blow me here I am here

Now-- I'm sucking you in, still not falling apart In one breath-- Take my hand and tell me what's in your heart

Say, and I'll answer How can I help you, say, Out of the twelve directions of the wind, I'll go the endless way."

[A. E. Hausmann] Well, this poem was well received by science fiction writers.

It's been cited in at least three science fiction works, and I think it's because poetry is said to bring us information from the future, the past, and the world, and also because the patterns of poetry seem to tell us what's inside our minds.

It's been said that poetry can bring people together for a while, and I agree, but what sticks in your mind isn't just because it rhymes, it's how you rhyme. The simple and clear rhyme, say and way on lines 2 and 4, is foreshadowed by the answer and quarters on lines 1 and 3, forming a block of poetry.”

By exaggerating the speed of life, we emphasize the fact that we die.

Years on Earth become one conversation, one breath.

It's a poem about loneliness -- the "I" in the poem feels no connection, and it goes on -- until you get to the word "save."

This isn't the first time the poet himself wrote what he wanted to hear.

Now, this next poem completely changed what I liked, what I read, and what I thought I could read as a sensible adult.

If you're reading this for the first time, you might not understand what I mean-

"Garden" "Coral Oleander From a 1950s lipstick ad

Fruit of such knowledge tree

Is it because we have a problem that looks like a clichéd phrase?

Innuendo vulgar terribly rough threats"

[Rae Ahmantraut] I found this poem in a 1989 anthology of equally esoteric poems.

I just heard about some shady writers who couldn't be called language poets, so I went to see what they were like. Some people didn't really resonate with me, but there was something about this Ray Ermantraut, and I kept reading her work until I felt like I knew what was going on, like this poem.

It's about "The Garden of Eden and the Fall," and "The Story of the Biblical Fall," in which, as we all know, sex, death, and sin come to the world at the same time.

He also describes how appearances can deceive us, how culture can drive us into unpredictable behavior and behavior.

"Tasting" can mean slurping, "kissing," or "beating," as in domestic violence, because sexual attraction can also be a threat.

Red, which means breeding, can also mean poison.

oleander is poisonous

Well-worn usages like "tasting" a "kiss" or "blow" suggest that we're made to feel guilty, based on the implicit assumption that sex is sinful, or that we've tolerated blatant sexism.

we let men take the lead

The poem takes an old lipstick ad, and the sharpness of the words and their reversals and pauses are all resistance to the words of the ad, to the words of the ad that speak so easily of what we should want and do and think.

That resistance is a large part of the gist of the poem, which, as Armandrout indicates, is to hear serious threats and deadly infidelity in everyday language.

Now, is it okay to interpret this very difficult poem in this way?

This time, I emailed the poet a draft of my talk, and she said, "Yeah, it's about that."

(Laughter) (Applause) But most of the time I don't get it, I don't know until the end.

I'm not sure, but that's okay

You can only listen to poetry, and you can look at it, make guesses, and wonder if it gives you something you need.

Now the next poem is older than Armandrout, but newer than A. E. Hausmann.

"Oh sublime existence" "Ah, sun, oh sublime existence, piercing the dying bough and rising up, oh sublime existence

A dark figure hidden in the grass - Marijuana Pale gloomy eyes - Addicts run away

The beautiful stars, the merciless politics, and the painful duress will run away.

The fear of bedtime, the fear of life and death, run away

That sublime existence rises from hell and walks without hesitation, a sublime existence."

[Wallace Stephens] Now, the sun in Wallace Stephens' poems seems so damning, because the characters in the poems are so afraid.

In the morning the sun rises through the branches, knocks out the drops, the sleepy eyes, the grass, and defeats the stars, which were conceived as enemies.

"Divine" has the classical meaning of "spectacular" and the modern sense of "brave".

This sun isn't afraid to show its face

people are afraid

he couldn't sleep all night

This is made clear in the 4th verse where "run away" is repeated.

Maybe this person wants to "run away", but maybe he'll follow the example of the sun and take the leap.

Stephen leaves the odd-sounding word "meditation" at the end.

Unlike the sun, humans think

We ponder past and future, life and death, heaven and hell.

it makes us afraid

The patterns in the poem aren't just about what someone thinks or does or what happens, they tell us what it's like to be so worried, so lonely, so curious, so stupid, so insane, so brave.

That's why poetry can be permanent, it can be personal, it can be ephemeral, it can be both your front and back.

Scottish poet Dennis Riley compared "poetry" to needles, silver in appearance and knitting, and American poet Terrance Hayes wrote six poems entitled "Wind in a Box," one of which is.

I'm asking, "Tell me what to do when I die."

The answer is either stay with us or don't stay like words, air and wind.

It's easier than ever to find a poem that might stay with you in your heart From long ago, far from this moment, far away or close wherever you live.

Poetry helps you put your feelings into words, but it also puts you in touch with people who are very different from you in terms of emotions and ways of life, and people who are very much older than you.

Some poems say that's what poetry is for.

That's what John Keats does in perhaps his most mysterious poem.

Some of the mysterious reasons are that it's apparently unfinished, perhaps left unfinished, or perhaps written for a character in a play. But it just seems to be Keats' thoughts on his own writings and manuscripts, or at least what I can see is that "limited life" speaks to the power of the age-old art of poetry. it feels like

"Still warm my living hand, if you hold it tight within now, and if your life will eventually run out and you enter the cold, silent tomb, then your days, when you think of me standing in your dreams, when your own heart thinks that blood will be lost, red-colored life may not flow again in my dead veins.

thank you

(applause)

Even nature's most nasty creatures have big clues.

The big difference between natural and man-made is robustness.

Robust systems can remain stable in complex new environments

Cockroaches can run over uneven ground with amazing stability.

Even when you attach a jetpack or place it in an earthquake-like tremor, you'll be able to maintain stability through your exquisite gait without using your brain.

No problem on complex terrain like grass, no loss of balance

It's a newly discovered behavior that uses its body shape to lean naturally and slide through artificial grass.

A robust system can use the same body structure for different tasks.

This is also a newly discovered behavior.

It's flipping around very quickly, hiding itself, in less than 150 milliseconds.

It can run upside down quickly along poles, branches, and wires.

It can perform gymnastic tricks that today's robots can't imitate.

Using the same body structure, they can do a myriad of maneuvers, and they can handle a variety of different situations surprisingly well.

They have wings that allow them to fly when it's warm, but they also use those same wings to get up when they're upside down.

very effective

A robust system is highly fault tolerant and can remain functional in the face of problems

this is a cockroach leg

It has thorns, sticky paw pads, and claws, but even if you remove these parts, it can still run over uneven ground, like the image below, and its speed is almost the same, which is a big deal.

You can climb the net even if you don't have toes

This is a six-legged gait, alternating between three legs, but in nature you can lose a leg.

This is moving without the middle two.

Even if you lose three legs and become three-legged, you will learn a new way of walking that will allow you to bounce.

I'd like to point out that all the footage is slowed down by a factor of 20, which is actually very fast.

A robust system is also resistant to damage

Where cockroaches climb walls

At first glance, it looks like it's climbing smoothly and quickly, but when you slow down the playback, you'll see that it's not what you imagined.

What do cockroaches do

In order not to slow down, it deliberately hits the wall head-on and turns in less than 75 milliseconds.

We can do this because we have an extremely good exoskeleton.

It's made entirely of tubes and plates and the flexible joints that hold them together.

This is dissecting the abdomen of a cockroach.

You can see that it's made of a rigid plate and a flexible membrane.

A colleague in the engineering department at Berkeley, together with his students, developed a new manufacturing technique, a sort of origami exoskeleton, in which laser cuts, stitches, and folds a robot.

Can be assembled within 15 minutes

This is DASH, a dynamic autonomous crawling hexapod, very flexible, and these properties make it very robust.

very strong against damage

(Laughter) I can do some cockroach movements.

With a well-designed flexible body, you can turn upward against a wall in a simple way.

I can even pull off that flipping and hiding movement

cockroaches everywhere

It turns out that it's able to get in because it can squeeze through a three-millimeter gap, the size of two pennies, and it can move through this narrow gap very quickly.

To understand it better, we put the exoskeleton on a CT scan, and it shows that the body can be compressed by more than 40 percent.

In a stress-strain analysis in a materials testing apparatus, the cockroach was able to withstand a force of 800 times its body weight and was able to fly and run normally after this.

I don't know where my curiosity-driven research will lead me. Maybe one day I'll wish for a swarm of robots inspired by cockroaches.

(laughs) Thank you very much.

(applause)

I will tell you one story

200 million years ago

This is the story of the neocortex -- the new skin This is the story of the neocortex -- the new skin

Now, in early mammals like mice -- by the way, only mammals have a neocortex -- by the way, only mammals have a neocortex --

It was the size and thickness of a postage stamp, just a thin crust covering their walnut-sized brains, but it enabled new ways of thinking.

It allowed us to invent new habits, not just follow the hard-wired habits of non-mammalian animals.

For example, if a rat is escaping from a predator and their escape route is blocked, they will try to find another solution.

I don't know if it will work, but if it does, it will learn it, acquire a new habit, and that habit will spread like a virus throughout the species.

Other rats see it and say, "You were smart enough to go around that rock," and they adopt the new behavior themselves.

Non-mammal animals cannot do this.

habits are fixed

A lifetime is not enough to acquire new habits.

Evolve new habits over a thousand generations

200 million years ago it was all right

the environment changes slowly

It would have taken nearly 10,000 years for the environment to change significantly, and that's about the time it takes to evolve new behaviors.

That worked, but 65 million years ago

Something happened, a sudden, radical change in the environment.

It's called the K-T boundary (end of the Cretaceous) mass extinction

This was when the dinosaurs went extinct, 75 percent of the plants and animals went extinct, and it was also when mammals filled the extinct niche, and Biological Evolution said, "This neocortex is nice."

As mammals got bigger, their brains expanded at an even faster pace, and the neocortex expanded even faster, developing characteristic ridges and creases to increase surface area.

If you take the human neocortex and unfold it, it's about the size of a table napkin, very thin tissue.

As thick as a table napkin

But because of the many ridges and wrinkles, it takes up 80 percent of the brain, and that's where thinking takes place, and that's where thinking takes us to the next level.

The old brain that provides the basic needs and motivations is still there, but my need for control, for example, is sublimated by the neocortex -- whether it's writing poetry, developing an app, or giving a talk at TED, that sublimation happens in the neocortex.

Fifty years ago, I wrote a paper explaining how my brain works -- a sequential combination of modules.

Each module processes one pattern

learn the pattern remember the pattern

run the pattern

And modules are organized hierarchically, and the hierarchy is organized by our own thoughts.

Fifty years ago, there was little further development from that paper.

But now I got to meet President Johnson.

I've been thinking about this for 50 years, and a year and a half ago I published a book called "How to Create Thought."

Neuroscience is doubling data about the brain every year.

The imagery of every brain scan is doubling every year.

Now you can look inside a living brain and see individual neurons making connections and communicating in real time.

The brain creates the thoughts and the thoughts create the brain

You can see the scene, actually this is the key

I will explain briefly

I counted the number of modules

There are nearly 300 million of them, and we've created a hierarchy of them.

Here's a quick example

There are a lot of modules here These recognize the uppercase 'A' horizontal bar That's all there is to it

They don't react to beautiful music, or to nice women coming up to them.

Output in the following hierarchy Each hierarchy is organized at different conceptual levels

Each one is more abstract than the previous one The next one says "capital A"

At a higher level you might say "APPLE"

Information also flows downward

So when the APPLE recognizer sees A-P-P-L, that layer thinks, "Wow, E is probably next," and tells the E recognizers, "Keep an eye on E, it's coming soon."

The E recognition module uses a low threshold to recognize objects that are not invisible to E.

So I said, "I saw E," and the APPLE module said, "I saw APPLE."

If you go up another five levels, you're at a fairly high level on this level, where you combine the information from the other five senses on the level below with the information from modules that recognize specific fabrics, voices, perfumes, and say, "My wife just walked into the room."

If you go up another 10 levels, you'll reach a fairly high level.

It's probably around the frontal cortex.

"That's funny she's cute"

It's easy to think that the upper hierarchy is more sophisticated, but it's the hierarchy below that that's actually more complex.

When a 16-year-old girl was undergoing brain surgery, the surgeon kept her conscious to talk to her.

I can do this because I don't feel pain in my brain I can do this because I don't feel pain in my brain

And when I stimulated a little dot in the neocortex, this red part -- she laughed.

The surgeons thought they had stimulated the reflexive laughter point, but they soon realized that they had found a part of the neocortex that recognized humor, and every time they stimulated that part, she felt the whole thing was hilarious.

The main comment was, "It's funny just you guys there," but the surgeons weren't funny because they were in surgery

So how is it in modern times?

Well, first of all, computers are learning human language with techniques similar to those of the neocortex.

It's actually similar to something I've developed called Hierarchical Hidden Markov Models that I've been working on in the '90s.

Jeopardy is an extensive natural language game, but Watson scored more than the two best players combined.Watson scored more than the two best players combined.

He got it right, too. "A long, boring speech with a foamy pie topping." "What is a meringue hallenge?"

The Jennings and others didn't know the answer to this question.

This is an advanced example of a computer being able to understand human language, and that knowledge was actually obtained by reading Wikipedia and other encyclopedias.

Five to 10 years from now, search engines will not be based solely on word combinations and links, but on information on the web and what you've read and understood in books.

When you're walking, Google pops up and says, "Marie, a month ago you were worried that your glutathione supplement wasn't crossing the blood-brain barrier.

In fact, 13 seconds ago, a new study was published introducing a completely new approach to glutathione intake.

I will now summarize

Twenty years from now we will have nanobots, and the technology for miniaturization is advancing rapidly.

They travel through the capillaries to the brain, and connect our neocortex to the cloud's artificial neocortex, extending the function of the neocortex.

We still have computers in our phones, so when you need 10,000 computers for a few seconds for a complex study, you can access the cloud and you'll be there in no time.

In the 2030s, if we need extra neocortex, the brain will be directly connected to the cloud, the brain will be directly connected to the cloud.

I walk and say, "Oh, it's Chris Anderson."

he comes closer

if you don't say something wise

time is 3 seconds

The 300 million modules in my neocortex aren't enough The 300 million modules in my neocortex aren't enough

I need another billion

There I can access the cloud

And our thinking becomes a hybrid of biological and non-biological thinking, and the non-biological part follows my law of accelerated returns.

it grows exponentially

Remember what happened the last time the neocortex expanded?

Two million years ago, we evolved into hominids and developed large frontal lobes.

Other apes have protruding foreheads,

no frontal lobe

But the frontal lobe isn't qualitatively special,

The neocortex is expanding, and the increased amount of thought is what has enabled us to make qualitative leaps in language and art, science and technology, and TED.

something other species couldn't do

In the next few decades we will leap again

We're going to extend the neocortex again, but this time it's not bounded by a well-structured container, but this time it's not bounded by a well-structured container.

expand without limits

This quantitative expansion will once again be a factor in bringing about a qualitative leap in culture and technology.

thank you

(applause)

Election night 2008, I was torn in two.

It's the night Barack Obama was elected president.

143 years after the abolition of slavery — and 43 years after the Voting Rights Act was enacted, an African-American was elected president.

Many of us thought this could never happen until this moment came.

And in many ways, this was the climax of the African-American civil rights movement in America.

I was in California that night, and it was home to another movement that was just beginning at the time, the marriage equality movement.

At this time, same-sex marriage was being voted on as Proposition 8, and as the results of the ballot were announced, it became clear that the right for same-sex couples to marry, recently granted by a California court, would be lost.

So on the very same night that Barack Obama won his historic presidential election, the lesbian and gay community suffered a very painful defeat.

Then things got even worse

Almost immediately, African-Americans began to be blamed for the passage of Proposition 8.

Most of the accusations were due to erroneous polls, which showed that 70 percent of black people voted yes.

Although it later turned out to be untrue, the idea that many black people were homophobic took hold and was quickly picked up by the media.

I couldn't take my eyes off this report

A gay commentator once said, "The African-American community is notoriously homophobic, and now that they've got their civil rights, they're trying to take away the human rights of other people."

There were even reports that some people used racist slurs against the gay rights rally attendees after the vote.

On the other hand, some African Americans denied or ignored the homophobia that actually exists in our community.

And some people were offended by the comparison between gay rights and civil rights, and I was once again depressed and overwhelmed and, frankly, resented by the fact that the two minority groups I belong to were at odds with each other instead of supporting each other.

I'm a documentary filmmaker, so after going through a period of venting my anger and yelling at television and radio, the next thing I wanted to do was make a film.

Why did this situation come to be a signpost in the making of this film?

It was why the gay rights movement came to be pitted against the civil rights movement.

This was not just an abstract question

I am a beneficiary of both movements, so this was a personal question.

And after the 2008 referendum, something new happened.

The quest for gay equality is gaining momentum at a rate that surprises everyone, and is still reshaping the laws, policies, institutions, and the country as a whole.

Gradually, it became clear to me that it didn't make sense to put the two movements against each other, and in fact they were deeply intertwined, and the reason the gay rights movement was able to succeed so quickly was to use some of the tactics and strategies that were first used in the civil rights movement.

Let's take a look at some of those strategies here.

First of all, what's really tangible and interesting is that when you look at the major events in the two liberation timelines, you can see how quickly the gay rights movement came to fruition.

Now, there are so many milestones in the civil rights movement. Now there are so many milestones in the civil rights movement.

It all started when a woman named Rosa Parks refused to give up her seat to a white person during a protest against racial segregation on public transportation in Montgomery, Alabama.

The protests lasted for about a year, and they made the civil rights movement more lively than ever.

I call this strategy the "I'm tired of having my foot stamped on my neck" strategy.

Gays and lesbians have existed in society since the dawn of society, but homosexuality was illegal in most states until the mid-20th century.

Just 14 years after the Montgomery Bus Boycott, an LGBT group is using this same strategy.

Known as the Stonewall Mutiny, the 1969 riot sparked a three-day riot in which members of LGBT advocacy groups responded to police brutality in a bar in Greenwich Village.

Oddly enough, black and Latino LGBT people were on the front lines of this riot, and it's also a really interesting example of the intersection of issues we're fighting: racism, homophobia, gender identity -- police brutality.

After the Stonewall riots, gay liberation groups sprung up all over the country and the modern gay rights movement as we know it began.

The next event on the timeline that I want to focus on is the 1963 March on Washington.

This event had a strong impact on the civil rights movement, when African Americans demanded both judicial and economic justice.

Martin Luther King delivered his famous "I have a dream" speech, but what many people don't know is that the man who organized the march was a man named Byard Rustin.

Byard is an openly gay man and has been described as one of the civil rights movement's greatest strategists.

He later became a strong advocate for the rights of LGBT people, and his life is a story of mixed struggles and hardships.

The March on Washington was one of the climaxes of the civil rights movement, and there was a fervent belief that African Americans could also be part of American democracy.

I call this strategy the "we are visible and we are many" strategy.

Some of the early homosexual activists were directly inspired by, or even participated in, the march.

Gay pioneer Jack Nichols said, "We, the seven members of the Matasene Society, walked with Martin Luther King." The organization was a pioneering gay rights group. "From that moment on, it was our dream to have a gay rights march on a scale that would rival this march."

A few years later, a series of marches took place, each adding momentum to gay liberation.

The first march was in 1979 - the next was in 1987

The third took place in 1993

About a million people took part, and after those who were so inspired and excited by the event returned to their communities, they each set up political and social groups to further raise the profile of the movement.

October 11th, the day the march took place, was later named Coming Out Day and is still celebrated around the world today.

These marches laid the foundation for the historic transformation that we are witnessing today in America.

And the final strategy is the "loving" strategy.

The name itself speaks for itself

In 1967, the Supreme Court ruled in Loving v. Virginia that all laws against interracial marriage were null and void.

This case has been described as one of the major civil rights events involving the Supreme Court.

In 1996, President Clinton signed the Defense of Marriage Act, commonly known as DOMA, into law, which required the federal government to allow only marriage between a man and a woman.

In America v. Windsor, a 79-year-old lesbian named Edith Windsor sued the federal government for being forced to pay inheritance tax on her late wife's assets, which heterosexual couples don't have to pay.

As the case raced through various lower courts, each time the Loving trial was set as a precedent.

When it went to the Supreme Court in 2013, the Supreme Court agreed with the plaintiffs' claims and repealed the Defense of Marriage Act.

it was an amazing event

But the same-sex marriage movement has enjoyed success over the years.

So far, 17 states have passed laws recognizing same-sex marriage.

Same-sex marriage has become the de facto battlefield of the gay equality movement, and it is fought in courts almost every day over laws against same-sex marriage, even in places like Texas and Utah that no one expected.

A lot has changed since that night in 2008 when I was torn apart.

I was able to shoot the example movie as well.

The documentary film, titled "The New Black," explores how the African-American community grapples with the gay rights movement in light of the current same-sex marriage movement and struggles over the meaning of civil rights.

I wanted to capture the tremendous transformation that was taking place at this time, but luckily or politically, yet another marriage battle was heating up, this time in Maryland, a state where African-Americans make up 30 percent of the electorate.

Tensions between gay rights and civil rights were boiling again, and I was fortunate enough to be able to film people's connections between the two movements.

This video shows two characters from the film, Kares Taylor-Hughes and Samantha Masters, going out on the streets of Baltimore to try and persuade voters.

(Video) Samantha: Here's a nice guy

Are you registered to vote?

Man: No Kares: Yes, how old are you now?

Male: 21 Caress: 21? I have to register to vote.

I need you to register to vote

Man: I don't vote gay

Samantha: So why? Why? Man: I don't agree

Samantha: That's not cool

Man: What made you gay? Samantha: What made you straight?

How did you become heterosexual?

Man 2: You can't answer that question (laughs) Kares: I didn't have the same rights as you, but black men like you stood up for women like me and I got the same opportunities.

As a black man, you too have a chance to stand up for someone else.

Gay or not, it's your brothers and sisters who are fighting now and they need your votes.

Man 2: Who in the world can tell other people who they can't have sex with or can't be with?

they don't have that kind of power

No one can tell you you can't marry that woman.

no one has that kind of power

Samantha: Did you know?

This state has put its power in your hands All I want you to do is vote, vote yes

Man 2: Okay

Samantha: Please vote for it, please? Man 2: ok

Calles: Do you both need community service time?

Are you there? Then why not volunteer with us?

how are you interested

Leave the food to me, I'll give you pizza

(Laughter) (Applause) Yoruba Richen: Thank you.

What's great about this footage that we were able to capture during filming is that Kares understands the history of the civil rights movement very well, but doesn't get hung up on it.

We're not limiting the civil rights movement to black people only.

She sees the civil rights movement as a blueprint for extending rights to gays and lesbians.

Maybe it's because she's a younger generation, maybe she's 25 now and it's easier, but Maryland voters actually passed a marriage equality amendment, and it's also the first time that marriage equality has been passed directly by voters.

African Americans supported the reform at a higher rate than ever before.

It's a complete turnaround from that night in 2008 when California passed Proposition 8.

It was a historic moment, and I felt it.

We in the LGBT community have gone from being viewed as pathological stigmatists and criminals to being seen as part of a greater human journey towards dignity and equality.

After a time when we had to hide our sexuality so as not to lose our jobs and our families, we literally sat at the table with the president, literally sat at the table with the president, and got loudly featured at his second inauguration.

I would now like to read out the President's words at his second inauguration, "We the people here today proclaim the most obvious truth: All men are born equal.

This is the guiding principle that continues to guide us like the stars, as it guided our forefathers at Seneca Falls, Selma, and Stonewall."

It goes without saying that everything is not perfect, especially when you look at how the issue of LGBT rights stands internationally. But the fact that the president has put the gay liberation struggle in the context of other great liberation movements shows how much progress has been made, like the gender equality movement and the civil rights movement.

The president's statement shows that not only were these movements interconnected, but that each drew on the other's strategies and inspired the other.

So just as Martin Luther King learned from and used Gandhi's strategies of civil disobedience and non-violence, which later became an unshakable foundation for the civil rights movement, the gay rights movement saw how the civil rights movement worked and used some of the same tactics and strategies to achieve even faster results.

This may be another reason why the gay rights movement has been able to move forward at a relatively fast pace.

While many of us still live in racially segregated neighborhoods, LGBT people are everywhere.

It exists in urban communities, in rural communities, in communities of color and immigrants, in churches and mosques, in synagogues.

We are your mothers, brothers, sisters and sons.

If your loved one or family member has come out, it may be easier to support them in their journey to equality.

In fact, the gay rights movement asks us, out of compassion, to stand for justice and equality.

This is perhaps the biggest and best gift that the movement has given us.

This movement universally calls us to face what's deepest in our hearts: the love we have for our brothers and sisters -- and our neighbors.

Finally, I would like to quote the late Nelson Mandela of South Africa, one of the greatest liberation fighters.

Nelson Mandela lifted South Africa from the ashes of racism under the law after the dark days of apartheid.He led South Africa to become the first country in the world to outlaw discrimination based on sexual orientation in its constitution.

Mandela said, "To be free is not just to throw off your chains, but to respect the freedom of others and live in a way that makes them better."

So as these movements continue, and as the struggle for liberation continues around the world, let us remember that it is not only when these movements are interrelated, but when they support each other and make each other better, that we can truly win.

thank you

(applause)

I grew up in a very small rural town in Victoria.

I was brought up very plainly

I went to school, played with my friends, fought with my sisters

it was completely normal

When I was 15, a local community official contacted my parents and said they wanted to nominate me for a community achievement award.

My parents said, "Well, thank you very much, but there's one big mistake.

She didn't get any credit." (Laughter) That's what my parents said.

I went to school, got good grades, and had a very humble part-time job at my mom's hair salon, and I just watched "Buffy the Vampire Slayer" and "Dawson's Creek."

Yes, opposite genre.

but my parents were right

I didn't do anything out of the ordinary

There was nothing that could be called an achievement without taking disability into account.

Years later, when I was in my second year of teaching at a high school in Melbourne, about 20 minutes into my sophomore law class, a boy raised his hand and said, "Teacher, are you ready to speak?"

I replied, "Speech?"

After all, he was giving a lecture on the honor decree law for a long 20 minutes.

This student said, "That's a motivational speech.

When people in wheelchairs come to school, they usually tell inspiring stories, don't they? ”

(Laughs) "Usually the venue is the large auditorium," he said.

This was my first realization that this child had only seen people with disabilities as objects of emotion.

For this kid, of course, it's not his fault, a lot of people think that way.

Most people don't see people with disabilities as teachers, doctors, manicurists.

Disabled people aren't treated as people; they exist to inspire.

In fact, when I'm sitting in this room, sitting in a wheelchair like this, what you're implicitly expecting from me is "impression," isn't it? (Laughter) That's right.

Ladies and gentlemen, I'm sorry to disappoint you all.

I didn't come here to impress you.

I'm here to tell you that we've been lied to about disability.

Yes, we are being lied to, that disability is completely bad, there is no doubt about it.

Disability is bad, so it follows that living with a disability is a good person.

Disability is not a bad thing, so there is nothing to be proud of.

Over the past few years, we've managed to spread this lie further through social media.

You've probably seen this image: "The only obstacle in life is a negative attitude."

Or here "I don't understand excuses"

Or this "try before you give up!"

I've just given you a few examples, but these images are all over the place.

You may have seen a little girl with no hands drawing with a pen in her mouth.

A child runs with a carbon fiber prosthesis

There are so many images like this, and we've dubbed them "inspirational porn."

(Laughter) The reason I say "porn" is because it's objectifying certain people for the benefit of others.

So in this case, we're using disabled people for the benefit of able-bodied people.

The purpose of these images is to inspire and motivate you, so when you look at them, you say, "My life sucks, but there's more down below.

It's better than them."

But what if you were "them"?

I've had countless experiences where strangers have approached me and told me that I was brave or that they impressed me, and that was long before I was famous.

They're like, if I woke up in the morning and remembered my name, they'd admire me.

The image you've seen, this kind of image uses the disabled as an object for the able-bodied.

Looking at people with disabilities, able-bodied people can look at their anxieties objectively and realize that they are still blessed.

Life as a disabled person is really tough.

There are parts that need to be overcome

But what we disabled people get over isn't what you think.

it's not about the body

I dare to use the word "disabled" because I support the social model of disability, the idea that disability from the society we live in is worse than our bodies and our medical conditions.

I've been with my body for a long time

I like it quite a bit

They do what I need them to do. I'm reaching the full potential of my body, just like you. So are the kids in that image.

I didn't do anything special

Those kids are just maxing out their physical abilities.

So is it really the right thing to objectify them and share images like we do?

When people say, "You're inspiring," of course they're applauding.

that kind of thing happens

It's a lie, we're made to believe that having a disability makes us special.

really different

you think so

Because I'm arguing against "impression" here, I'm sure you'll say, "Hey, Stella, you've been moved by something, haven't you?"

Of course there is

I am always learning from other people with disabilities.

But it's not like I'm better off than them.

I'm learning some genius ideas, like using tongs to pick up dropped objects.

You're a genius

We learn from each other's strengths and perseverance, and we're not fighting against our bodies or illnesses, but against a world that treats us as objects and objects.

I am acutely aware that lying about disability is an unforgivable injustice.

making our lives messy

"The only obstacle in life is a negative attitude" is silly because it's not true, it's the social model of disability itself.

No matter how much you smile when you're struggling to climb stairs, the stairs won't turn into ramps.

Absolutely (Laughter) (Applause) You can smile at a TV screen and the subtitles won't pop up for the deaf.

No matter how pleasantly you stand in a bookstore, all your books will not turn into Braille.

That's impossible, isn't it?

I want to live in a world where disability is seen as normal rather than special.

I want to live in a world where a fifteen-year-old girl sitting in her room and watching Buffy the Lover isn't a feat because she's just sitting there and watching.

I want to live in a world that doesn't have such low expectations of people with disabilities, a world that doesn't get praised for getting out of bed in the morning and remembering their name.

I want to live in a world where we, disabled people, are measured for our true achievements. I want to live in a world where a high school sophomore in Melbourne doesn't flinch when a new teacher is in a wheelchair.

It's not the disability that makes a person special, it's the questioning of one's knowledge of disability.

thank you

(applause)

Less than a year after 9/11, I was writing an article for the Chicago Tribune, "On Shootings and Murders," and I was left with a gloomy sense of hopelessness.

As a student activist in college, I decided to join a protest against animal testing.

I thought it was a safe way to do something positive, but I still got the worst of it. We were all arrested.

This is me when I was arrested. I have the evidence leaflets.

I was acquitted, but a few weeks later, two FBI agents came in and said, "If you don't work with the FBI to spy on terrorist groups, they'll label me as a domestic terrorist."

I wasn't deterred, but I was horrified. When the fear subsided, I began to wonder why this happened. Why would an animal advocate, an environmentalist who didn't hurt anyone, be recognized by the FBI as the nation's greatest terrorist threat?

A few years later, when I was asked to testify before Congress about an article I wrote, I told lawmakers, "While everyone is talking about protecting the environment, there are people who are risking their lives to protect forests and block pipelines."

They're standing between the whaler's harpoon and the whale.

Every day, someone takes action. An Italian protester climbed over a barbed wire fence to take out a beagle dog and save it from animal testing.

The protests were so amazingly effective and so popular that in 1985, their opponents coined the term "eco-terrorist" to try and get public opinion.

it's just a coined word

This is a company that is helping to enact new laws like the Animal Business Terrorism Act, which declares that any activity that results in loss of profits is terrorism.

Even members of Congress don't know about this law.

The bill passed the House with less than 1 percent of the people there.

Other lawmakers attended the memorial service

He was offering prayers to Dr. King, whose work had been branded an act of terrorism in the name of animals and the environment.

Proponents of law reform say the law is needed to crack down on extremists like vandals and arsonists.

A company called TransCanada uses presentations like this to explain to the police how to accuse non-violent protests as acts of terrorism.

The FBI's manual talks about ecoterrorism, not about subversion, but about PR.

Now, in many countries, companies are pushing for new laws to ban the filming of animal cruelty scenes.

Just two weeks ago, it was enacted in Idaho, and we filed a lawsuit claiming it was unconstitutional and threatening to the press.

The first person to be charged with violating the "ag-gag" law was a daughter named Emmy Meyer, who saw sick cows being bulldozed from a slaughterhouse on a public road.

I did something very mundane. I took a picture.

Within 24 hours of writing this story, it turned into a riot, and all charges against her were dropped.

Apparently, revealing articles like this are threatening.

I learned that under the Freedom of Information Act, the counter-terrorism unit is monitoring my articles and statements.

Even trivial articles like this are monitored-

It was described as “persuasive and well-written article”

(Applause) You could use that as a recommendation for your next movie.

As journalists, we believe in the power of education and remain unwavering in our convictions.

Sunlight is the greatest weapon

Dostoevsky wrote, "Man wants to be convinced that he is a man and not a piano keyboard."

Time and time again throughout history, those in power have instilled fear to stifle truth and dissent.

Let's play a new tune

thank you

(applause)

Four years ago, a "security researcher" -- as most people call him a "hacker" -- discovered how to literally flood ATMs with money.

His name was Barnaby Jack, and the technique was later called "The Jackpot" after him.

The reason I'm here today is to claim that we need hackers.

It would have been easy for Barnaby Jack to misuse his knowledge to become a professional criminal or 007 villain, but he chose to share his findings with the world.

He thought, "Sometimes you have to present a threat as a catalyst for a solution."

I feel the same way

that's why i came

We are often frightened and fascinated by the capabilities of hackers.

they are terrifying

On the one hand, their choices have dramatic consequences that affect us all.

I'm here because I believe that hackers are far from necessary to us, they're so important to us that we might even call them the immune system of the information age.

Hackers can make us sick, or they can help us discover and deal with threats lurking around the world.

Telling this story could get me hacked, so let's save ourselves the trouble.

It's very TED-y, but I'm going to show you the most embarrassing picture for me.

Maybe you just can't find me. I'm the one standing at the edge of the picture -- I look like a boy.

At that time, I was such an otaku that even the guys on the Dungeons & Dragons team wouldn't let me in.

The person I admired was Angelina Jolie.

1995 movie — as Acid Byrne in Cybernet.

She's beautiful and can rollerblade, but above all, being a hacker is the source of her power.

I started haunting her in hacker chat rooms and message boards.

I remember one night, late at night, when I found some PHP code.

I didn't know how the code worked, but I just copied and pasted it into a password-protected site.

It feels like "open sesame"

The gimmick was simple, I was just a childish cracker, but I felt like I had found limitless power -- I was curious.

This is the power that hackers feel

Geeks like me discover the gateways to great powers, which require skill and indomitable intellect, but luckily you don't need radioactively mutated spiders.

But with great power comes great responsibility, and we all want to think that with that much power, we should only use it for good.

But if you can read your ex's emails or increase your savings by several orders of magnitude,

what do you all do?

In fact, many hackers are tempted to lose billions of dollars a year through fraud, malware, and simple identity theft, and the problem is serious.

On the other hand, there are hackers who just like to decipher things, and they're the ones who find the weak spots in our society and give us the power to deal with them.

That's exactly what happened last year, when a security researcher named Kyle Lovett discovered a serious flaw in the design of one wireless router, like the one you find in your home or office.

Anyone could connect remotely to this router over the internet, and if they had a hard drive connected, they could download information, no password required.

Of course he reported it to the manufacturer, but it was ignored.

Maybe the manufacturer thought it was a feature, not a bug, that anyone could access it, but two months ago, a group of hackers took advantage of this bug to get into other people's data.

but they didn't steal anything

Instead, I left a note saying, "Your router and information are now accessible to the world.

Here are the measures

If its helpful then im happy"

It's certainly illegal to break into other people's files, but they made this company fix their product.

In the hacker community, the public disclosure of vulnerabilities is called "full disclosure," and it's a topic of debate, but how much have hackers improved the technology we use every day?

Next, let me introduce Kahlil's activities.

He's from the West Bank of Palestine, and he found a serious privacy flaw on Facebook that he tried to report to the bug bounty program.

It's a great initiative for companies to reward hackers for reporting vulnerabilities in their code.

Unfortunately, due to a misunderstanding, his report was denied.

Frustrated, Khalil used the bug he discovered to post on Mark Zuckerberg's Facebook wall.

By bringing it to their attention, the bug was indeed fixed, but they weren't given the bounty they were supposed to pay for finding it because they didn't report it properly.

But fortunately for Kahlil, a group of hackers

We've raised over 13,000 dollars to reward him for his discoveries, and as a result, one of the hottest debates in the tech industry is what incentives hackers should have to do the right thing.

But there must be a more important point

Like Facebook — even companies founded by hackers have complicated relationships with hackers.

So it will take time for more conservative organizations to embrace hacker culture and its chaotic creativity.

But it should be worth the effort. If you go head-to-head with every hacker without making the effort to embrace it, you're stifling forces beyond your control, at the cost of stifling new ideas and regulating knowledge.

It's going to hurt you later

If the target you're trying to corner is a hacker who's willing to sacrifice freedom in pursuit of ideals like freedom on the web, especially in the current climate where governments and corporations are scrambling to regulate the Internet.

What amazes me is that humans in the dark corners of cyberspace can be the last bastions of rebellion, leading a global political hacker movement, groups like Anonymous.

This global movement needs no explanation, but six years ago, they were just an internet subculture, eager to post crappy cat pictures and trolling the internet.

That all changed in early 2008 when the Church of Scientology attempted to take down videos that had leaked to multiple websites.

That's when Anonymous was born from a seemingly motley collection of netizens.

Eventually, they protested the removal of the information from the internet, responding with cyberattacks, elaborate pranks, and organized protests around the world, from my hometown of Tel Aviv to Adelaide, Australia.

In this case, Anonymous proved that thought can drive the masses out of front of the keyboard and out onto the street, thus laying the foundation for a variety of counter-tactics -- against the injustices found in the online and offline worlds.

Since then, their targets have varied.

Exposing corruption and abuse of power

Hacked powerful people and politicians to bring down websites — I think the impact is far greater than a simple denial-of-service attack or the leak of classified documents.

They're redistributing wealth like Lopin Hood, but they're not after money.

It's not even a document. The aim is to get attention.

They shed light on their ideals and make us aware, acting as a global lens that focuses on issues that we should be aware of but are not aware of.

Anonymous have been called "criminals" and "terrorists," and while I can't justify their illegal means, the ideas they fought for are important to all of us.

In reality, hackers don't just break things,

can connect people

Just trying to remove something from the net creates a backlash, so you can imagine what would happen if you tried to shut it down.

That's what happened in Egypt in January 2011. President Hosni Mubarak was desperate to quell the raging revolution in Cairo.

Such an act by a government was unprecedented, and the hackers resented it.

Hackers like Telecomix were already on the ground helping the Egyptians bypass censorship, and they used Morse code, amateur radio, and other clever evasions.

It used low-tech that the government couldn't shut down, but when the net went down completely, Telecomix did something out of the ordinary.

What they found in Europe was a provider with 20-year-old analog dial-up line equipment.

They opened up 300 lines for the Egyptian people, giving them slow but dreamed internet access.

this was a success

It worked so well that some people used it to download "How I Met Your Mother."

Egypt's future is still unclear, but just a year later, when the same thing happened in Syria, Telecomix set up a similar line.

But this kind of power can be viewed differently depending on your standpoint. What might be a hero to one person might be a villain to another.

They've gone after several high-profile targets over the years, such as hijacking an Associated Press Twitter account and tweeting, "The White House was attacked - President Obama was injured."

This was, of course, a lie, but the fact that the Dow went down that day was very real, and a lot of people lost a lot of money.

This is what is happening all over the world right now.

Hackers wield social, political and military clout in conflicts across Crimea, Latin America, Europe and America.

Individually and collectively, among volunteers and in military conflicts, hackers are everywhere.

They come from all walks of life — race, ideology, gender.

they set the world on a stage

Hackers represent the extraordinary force for change in the 21st century.

Because access to information is critical to spreading power, and that's what governments are trying to control -- what they're aiming for with "all-you-can-eat" surveillance programs.So governments need hackers.

As a result, the regime and hackers have had a love-hate relationship for a long time, with the technology being leveraged by the very people who vilify hackers.

Two years ago, I met General Keith Alexander.

He's the head of the NSA and commander of the U.S. Cyber ​​Command, but at the time he wasn't wearing a general's uniform with rank insignia, but jeans and a T-shirt.

At DEF CON, the world's largest hacker conference.

Perhaps General Alexander didn't see 12,000 criminals in Vegas then.

It must have been an untapped potential.

Because he showed up to recruit talent.

He said, "Right now, in this room, we have the people our country needs."

But the hackers responded from the back row, "Then don't arrest us."

(Applause) Sure, hackers have been in prison for a long time.

Today it's not so easy to black and white, but perhaps hackers alone have the power to counter government overreach and corporate data collection and storage.

i think there is hope

Over the last 30 years -- hackers have done a lot, but they've also impacted civil liberties, technological innovation, and online freedom. So it's time to change the way we look at hackers.

I've been in this world for many years, and I've come to understand both the challenge and the beauty of hackers.

Driven by a sense of duty to take advantage of it and change it, they expose weaknesses in this fast-changing world.

Hackers make us fix our weaknesses, we want something better, and that's why we think we need them, because it's not information that wants freedom, it's ourselves.

thank you

Thank you. (Applause) Let's hack the planet!

Welcome to 5 Dangerous Things You Should Let Your Kids Do

i have no children

I'm borrowing my friends' children - so (Laughter) don't take my word for it.

i'm gamer tully

I'm a computer scientist, but I'm also the founder of what's called the School of Crafts.

It's a summer school where we help kids learn how to make things they can imagine.

We make a lot of things, and we give power tools to second graders.

So if you send your children to craft school, they will come home bruised and scratched and bleeding.

As we all know, child safety regulations are getting stricter all over the world.

There seems to be no limit to how crazy it can get.

All vinyl films on products manufactured in or sold in the United States carry a suffocation warning.

The coffee cup has a warning that the contents may be hot.

And we seem to think that anything sharper than a golf ball is too sharp for children under the age of 10.

Where will this trend end?

If you go around everywhere and remove all the sharp and puncture objects, the first time a child comes in contact with something sharp or something other than a round plastic object, they're going to get hurt by it.

As we narrow the boundaries of our safe zone, we keep children away from valuable opportunities to learn how to interact with the world around them.

And no matter how hard we try, children always try to find the most dangerous thing they can do, no matter what the circumstances.

So, despite the provocative title, this presentation is really about safety and how to raise children to be creative, confident, and in control of their environment.

What I am about to present is an excerpt from a book I am writing.

The book is titled "50 Dangerous Things".

I'm going to talk about five things

Number one - play with fire

Learning to control one of nature's most fundamental forces is a pivotal moment in any child's life.

Whether you remember it or not, it was the first time we took control of one of the enigmatic forces of nature.

Those mysteries will only be revealed to those who get the chance to play with fire.

playing with fire

It's one of the great things we've discovered so far

By playing with fire, children learn about fire and the basic principles of intake, combustion and exhaust.

These are the three elements you need to successfully control fire.

Open-air fire is like a laboratory

I don't know what children will learn from playing with it, but let them play with fire the way they do.

Children will learn things they can't learn from playing with Dora's Adventure toys.

Second - take a pocket knife

Pocket knives seem to have flowed out of our cultural consciousness, and I think that's a terrible thing.

(Laughter) My first pocket knife was the first all-purpose tool I was given.

It's a spatula, a crowbar, a screwdriver, and a blade.

And it's -- it's also a powerful and empowering tool.

In many cultures, infants are given knives as soon as they become children.

This is Inuit children cutting whale blubber

I saw this in a Canadian Film Agency movie when I was 10, and the idea of ​​a baby playing with a knife has stuck with me ever since.

Even at a very young age, children can feel their abilities expanding through tools.

Make up a few very simple rules: always cut away from the body, keep the blade sharp, and don't overdo it - these are things kids can understand and do.

Children will surely get hurt

I have some terrible self-inflicted cuts on my leg

But children are young and heal quickly.

(laughter) Three eyes – throw the spear.

Our brains are actually connected to throwing things, and like muscles, if you don't use a part of your brain, it will eventually degenerate.

But if used, any muscle can strengthen the whole, and the same can be said for the brain.

Throwing exercises have been shown to stimulate the frontal and temporal lobes, which are associated with visual acuity, three-dimensional understanding, and structural problem-solving.

Throwing is a combination of analytical and physical skill, which is why it's such a great full-body workout.

This kind of targeted training is also great for developing children's attention and concentration, because throwing things is amazing.

Fourth – Disassemble your electronics

Inside your dishwasher is a world full of interesting things

Next time you dispose of some electrical appliance, instead of throwing it away

Take it apart with your kids or have them come to my school and we'll take it apart together

It's a great exercise for children to figure out what they are, even if they don't know the parts. They develop a sense that they can take things apart, and if they know the parts of any complex thing, they can eventually understand the whole.

It's the awareness that you can know something

These mysterious boxes that we take for granted are very complicated objects that someone has made, but you can understand them.

Fifth - there are two here

First, Violate Digital Copyright Laws

(Laughter) Besides safety regulations, there are laws that try to limit how we interact with the things we own, in this case digital media.

It's a very simple exercise - buy a song on iTunes, burn it to a CD, rip the CD to MP3 and play it on the same computer

you have violated the law

Legally the Recording Industry Association of America can come and punish you

It's an important lesson for children to learn that some laws can be broken by accident, and that laws need interpretation.

It's when we play with things and pry them open and take them apart and use them for something else, or when we go out in the car.

It's like talking to a child

Driving a car -- it's a really exciting thing to do with a little kid. This is the ultimate.

This is a great stage for children.

Children fall in love with cars at the same time they try to understand things like dinosaurs, big things in the outside world.

Cars are similar, and children can get in and drive them.

It really gives children the chance to see the world in ways they wouldn't normally be able to.

and it's perfectly legal

Find a large vacant lot, make sure it's empty and it's private property, and let the kids drive the car.

actually it's very safe

and the whole family will enjoy

(Laughter) Well, that's it. This is fifth and half.

Halfway through my PhD, I was stuck and helpless.

Every direction I tried researching came to a dead end.

The basic premise of my research seemed to have gone awry.

I felt like a pilot flying through the fog, and I didn't know which way to go.

I don't even shave my beard

I couldn't get out of bed in the morning

I didn't feel right going through the gates of a university either, because I had studied the work of scientists like Einstein and Newton, and I thought I was completely different from them, because science only teaches results, not processes.

So it was impossible for me to become a scientist.

But with enough help, I managed to pull through and make new discoveries about the natural world.

It was a wonderful feeling, and it made me quietly savor that I was the only one in the world aware of a new law of nature.

When I started my second PhD project, the same thing happened again.

i'm stuck i'm done

So I started thinking that there might be a pattern.

When I asked other grad students, they said, "Yeah, the exact same thing happened, but no one ever told me that."

We learn science like a series of logical steps between questions and answers, but research is nothing like that.

At that time, I was also studying to be an improvisational actor.

So physics by day, laughing and jumping and singing and playing guitar at night.

Improvisation, like science, is about going into uncharted territory, because you have to go on stage without a director, without a script, without knowing what role you're going to play, without knowing what the other characters are going to do.

But unlike science, improvisational theater teaches you on the first day what happens when you step on stage.

I fail badly and get stuck

be handed over

So I practice to stay creative when I get stuck.

For example, we all got together in a circle, and one by one, we practiced doing the world's worst tap dance, and everyone else clapped, applauded the dancers, and cheered them on.

When I became a professor and was placed in a position to supervise the research of my own students, I realized again that I don't know what to do.

I've spent thousands of hours studying physics, biology, and chemistry, but I've never learned an hour or a single concept of how to give advice, how to lead someone into the unknown, or how to motivate.

So I went back to improvisational theater and told my students what would happen if they started doing research on their first day.

Because every time we do something, like if I'm going to touch this blackboard, my brain first builds a schema that accurately anticipates what my muscles are going to do before I move my hand, and if I get in the way, the schema doesn't match reality, creating the stress of cognitive dissonance.

That's why the schema has to match reality.

But if you just believed in textbook science, you would have the following schema for your research.

Let A be the question, B be the answer. Research is a straight path.

The problem is, if the experiment doesn't work, or if the student loses motivation, it's perceived as a complete mistake, and it's incredibly frustrating.

So I teach my students a more realistic schema.

This is just an example of how reality doesn't match the schema.

(Laughter) (Applause) I teach students a different schema.

A is the question, B is the answer. If you don't forget to create even in the fog and start researching, you'll reach a point where you've failed experiments, failed experiments, failed again, failed again, negative emotions swirling around.

This place is called "moyamoya"

Sometimes I get lost in the fog, for a whole day, a week, a month, a year, all through my life as a researcher, but sometimes, if I'm lucky and have enough support, I can find a new answer from the materials at hand, or while I'm thinking about the big picture of the fog.

And if you fail the experiment, fail the experiment, you get there, and you write the arrow from A to C and publish it publicly.

This ambiguity is inherent in research, it is inherent in our work, because ambiguity is the keeper of boundaries.

We're on the lookout. To discover something truly new on the border between the known and the unknown, we have to change at least one of our basic assumptions, and that's a pretty brave thing to do in science.

Every day we find ourselves on the borderline between the known and the unknown, and we face a blur.

I put B in a known country, right? I put B in a known country, right?

No research can start without B, but C is much more meaningful, and that's the beauty of research.

The mere mention of the word "moyamoya" has transformed my research group. A student comes up to me and says, "Professor, you're in a moyamoya."

(Laughter) Actually, I'm a little stoked, because maybe we're getting closer to the boundary between the known and the unknown, and we have the potential to discover something truly new. And when you start thinking about it that way, you'll realize that it's normal, it's even more essential, it's even more beautiful.

As a teacher, my job is to focus on helping the student, because psychology studies show that when people feel fear and despair, they become narrow-minded and tend to think conservatively and conservatively.

If you want to find your way out of the fog and take risks, you need the feelings of solidarity, support, and hope that you feel in connecting with other people.

Therefore, if you learn about moyamoya, you can learn effective means to have a conversation in moyamoya from improvisational theater.

This is based on the central principle of improvisational theater, and improvisational theater saved me again.

It's a "yes, and" response to a co-star's suggestion with a "yes, and."

So you say, "Yes, and," and you accept the proposal and expand it further.

For example, if one actor says, "There's a puddle," and another actor says, "No, it's just a stage," the improvisation is over.

That's the end, everyone gets frustrated

this is called blocking

If you don't take care of your communication, any conversation about science will be riddled with interruptions.

This is what happens when you say "Yes, and"

"There's a puddle."

"Oh, it's a whale! Let's catch its tail."

"I'll take you to the moon!"

"Yes, and" silences our inner critic

Our inner critic controls what we say so that others don't think we're crazy, crazy, or mediocrity.In science, being seen as mediocrity is fear.

"Yes, and" silences the inner critic and unleashes a latent creative force that you may not have been aware of, which may give you answers to your ambiguity.

That's why knowing the haze and "yes, and" has made the lab so creative.

The students started reacting to each other's ideas, and in the confluence of physics and biology, we made some amazing discoveries.

For example, for a year we were stuck trying to figure out the intricate biochemical networks inside cells, and we said, "I'm stuck in the fog." In a hilarious conversation, my student, Shai Shen-Oh, said, "Let's draw this network on paper." I said, let's use a giant sheet of paper, and let us print it for you." We printed that network, and when we tested it, it led to our most important discovery: this complex network is made up entirely of a few simple, recurring interaction patterns, like motifs in stained glass.

We call these network motifs, and their basic circuits help us unravel the logic of cellular decision-making in all living organisms, including our bodies.

Not long after that, I was invited to give talks, and I spoke in front of thousands of scientists around the world, but the "fuzzy" and "yes, and" findings stayed in the lab.

I only talk about results

Nothing to discuss at school

it was impossible

Eventually, I saw other scientists get stuck with no way to explain their current situation, their thinking narrowed to the safe side, their research potential was not maximized, and they were miserable.

i thought that's the reality

Let's be as creative as possible in our own laboratory. If all laboratories do so, science will eventually become richer and better.

That idea was turned upside down when I happened to hear Evelyn Fox Keller talk about her experience as a female scientist.

She posed, "Why don't we talk about the subjective, emotional aspects of doing science?

This is not a coincidence; it is a matter of values."

Science seeks objective, rational knowledge.

that's the beauty of science

But there's also a cultural myth that doing science means that the day-to-day actions you take toward that knowledge must also be objective and rational, like Mr. Spock.

If you classify things as objective and rational, the other side of the spectrum, subjective and emotional, naturally falls into the class of unscientific, or anti-science, or a threat to science, and you shut your mouth about it.

When I heard that science has a culture, it all clicked into place for me. If science has a culture, then culture can change, and if I do what I can, I can change the culture of science.

I went straight to the next conference to talk about my science, and then I talked about the importance of the subjective and emotional aspects of doing science and how to deal with them.

At a conference where 10 research papers were presented in a row, my words did not reach the ears of the audience.

I tried many times every time there was a conference, but I didn't get any understanding.

I was in a haze

In the end, I managed to get out of the fog with improvisation and music.

Every time I go to a conference since then, after the science talk, I'll tell you a special part two, called "Love and Fear in the Lab," which starts with a song about the biggest fear of any scientist: working hard and thinking you've made a new discovery, and someone else has it published first.

We call it the "scoop." It's the worst feeling of being ahead of the curve.

I'm afraid to talk to each other. This is not good. The purpose of science is supposed to be to share ideas and learn from each other.

It is like this

♪I got beaten again ♪ ♪ Scoop! scoop! ♪ Let's go

♪I got ahead of you again♪ ♪ Scoop! scoop! ♪ ♪ You got ahead of me again ♪ ♪ Scoop! scoop! ♪ ♪ You got ahead of me again ♪ ♪ Scoop! scoop! ♪ ♪ You got ahead of me again ♪ ♪ Scoop! scoop! ♪ ♪ Hey mama, you know the pain ♪ ♪ God help me, I'm ahead of you again ♪ (Applause) Thank you.

thank you for joining hands

So everyone starts laughing, they take a breather, they realize that there are other scientists around them who have the same problem, and they start talking about the emotional and subjective things that come up in doing research.

I feel like a serious taboo has disappeared

Finally we can talk about this at a conference.

And the scientists formed groups and met regularly to discuss the emotional and subjective aspects of guiding students and entering the unknown. We even started offering courses on the process of doing science and entering the unknown together.

My vision is that, just as every scientist knows the word "atom" and that matter is made of atoms, that all scientists know the "moyamoya" and the "yes, and", that science becomes ever more creative, more and more playful, with more and more unexpected discoveries for all of us.

What I want you to remember in this story is that the next time you face a problem that you can't find a solution to, be it in your work or in life, remember these words: moyamoya.

Someone who helps you say "yes, and" to your thoughts, and helps you say "yes, and" to your own thoughts, and expands the possibilities for you to encounter that quiet feeling in the midst of the fog.

thank you

(applause)

Six months ago, I received an email from a man in Israel. He read one of my books and wrote, "You don't know me, but you and I had the same parent 13 generations ago."

"My family tree lists 80,000 people, including you, Karl Marx, and some European aristocrats."

i didn't know how to interpret this

On the other hand, I'm like, well, when is he going to ask me to transfer $10,000 to his bank account in Nigeria? and Hey?

I also thought, 80,000 relatives, do I need it?

The troublesome things are enough with my relatives now, that's enough

And I won't be able to remember the name, I know all too well

But my other self said that this was something to watch out for.

I'm alone in the office, but I'm not alone at all.

I'm connected to 80,000 people around the world, which is the number that fills four Madison Square Gardens with relatives.

Some of them will be great, some of them will be frustrating, but they're all related to me.

So this email took me into genealogy, which I thought was a very boring and formal field, but turned out to be in the midst of a fascinating and controversial revolution.

Partly this is due to DNA and genetic testing, but partly because of the internet.

Now there are genealogy sites that take a Wikipedia-like approach: collaboration and crowdsourcing. You just upload your genealogy, and the site looks to see if the A.J. Jacobs on your genealogy is the same person as the A.J. It's on here. No, it could be millions.

I'm part of a global genealogy on a site called Geni, and there's a staggering 75 million genealogists here.

These 75 million people are related, married, or sometimes both.

(Laughter) And that includes people from all seven continents, including Antarctica.

I'm in it, and so are many of you, whether you know it or not, and you can see this connection.

This is my relative Gwyneth Paltrow.

She doesn't know I exist, but we're officially related.

There's only 17 distances between us

And Barack Obama is also a relative.

(Laughter) And he's my aunt's great-great-great-aunt's husband's father's wife's nephew, so he's practically my brother.

And my relative, of course, actor Kevin Bacon -- (Laughter) -- he's my great-aunt's son's wife's niece's husband's cousin's husband's niece's husband.

Yes, Kevin Bacon and I have a relationship of six degrees, plus or minus a few degrees.

I'm not bragging, because everyone's family tree has a celebrity, a historical figure, because we're all connected.

But what is this?

How important is it?

I think it's really important, and I'm going to give you five very brief reasons why.

First, it has scientific value.

This is an unprecedented representation of human history, and it provides valuable data on how diseases are inherited, how people migrate, and a team of scientists at MIT are just now studying global genealogy.

Second, it makes history come alive.

I discovered that I had a connection with Albert Einstein, so when I told my seven-year-old son about it, he was fascinated.

Albert Einstein is no longer a white guy with a funny haircut from the other world.

He's Uncle Albert. (Laughter) And my son wanted to know, "What did he say? E=MC squared?

And it's not all good news

I also found a connection to serial killer Jeffrey Dahmer, but I should point out that this is my wife's side.

(Laughter) (Applause) Yeah, I want to clarify this, sorry.

Third, it's interconnected.

We all come from the same ancestor, but don't take the Bible's explanations literally, scientists are talking about Y-chromosome Adam and mitochondrial Eve.

we have a little bit of their DNA

They are our great-great-great-great-great-great-great-great-great-great-great-great-grandparents, which means we are literally all biologically related. Estimates vary, but perhaps our most distant relatives on Earth share a common ancestor about 51 generations ago.

Now, we don't just share our ancestors, we also share our descendants.

Just like you have children, so do they. Let's see how fast offspring grow.

By the tenth or twelfth generation, you will have thousands, or millions, of descendants.

Fourth, it's a human-friendly world.

I know there's a feud in the family now

I have three sons and I watch them fight.

But I think people tend to favor their families a little more than others.

I think this genealogy is bad news for people with prejudices, because they're going to find out that they're related to thousands of people who belong to the people they care about.

not only are we of the same species

we are part of the same family

we share 99.9% of our DNA

And finally, number five, the effect of democratization.

Some families have good blood, like people say, "Oh, I'm a descendant of Mary, Queen of Scots, but you're not, you can't join my country club."

But this is going to be harder, because we're all relatives.

I am a descendant of Mary, Queen of Scots - by marriage, but still.

Yes, it's a very fascinating moment in family history, because things can change so quickly.

Same-sex marriage, sperm donors, and interracial marriage on a scale never before seen in history.

I think the more inclusive the concept of family is, the better, because you have more people to care for you.

Yes, I have these hundreds, thousands, millions of new relatives

I thought about what I could do with this information.

And I decided, why don't we throw a party?

yes that's what i'm trying to do

I invite you all

Next year, next summer, I will hopefully be hosting the biggest and best family reunion ever.

(Applause) Thank you.

please come

It's in the New York Science Hall. It's a great venue, and it's also the site of the former World's Fair.

There will be exhibits, food, and music.

Paul McCartney is 11 away from me, so I hope he brings his guitar.

I have yet to reply to your invitation, but I wish you all the best

And charming relatives give speeches all day long.

I'm already working on it. I've already secured a few.

Cass Sunstein, my relative and perhaps the brightest legal scholar, speaks.

he is a former member of the Obama administration

And at the other end of the political spectrum, George H.W. Bush, the 41st father, he's already saying he'll be there, comedian Nick Kroll, Dr. Oz, and many others.

And of course, the most important thing is you. I want you to come. I invite you all to visit GlobalFamilyReunion.org and find out where you are on the tree, because family and ethnicity are big questions. But I don't know all the answers.

Together we can solve this big problem

Dear Relatives, Thank you very much, I can't wait to meet you.

good bye

(applause)

First, let me tell you a little bit about my social life.

When I tell people I meet at a conference that I'm a professor of English and specialize in languages, they react in two ways.

The first group is terrified. (Laughter) They say, "You have to watch your language."

"You'll notice every mistake I make."

And then they stop talking. (Laughter) They wait for me to leave and go to someone else.

Another group, with a twinkle in their eye, said, "I wish I could have talked to someone like you."

They argue that the English language is going in the wrong direction.

(Laughter) A few weeks ago, at a dinner party, the man to my right told me how the Internet is degrading the quality of English.

Using Facebook as an example, I said, "Is 'defriend' a proper word?"

This question, let's think about it for a moment.

My boyfriend and I at dinner both know what "defriend" means, so when will a new word like "defriend" become sane?

Who has these formal decision-making powers over language?

that's the theme for today

When most people say a word is insane, it means it's not in the standard dictionary.

This raises a lot of questions, like who makes dictionaries.

But before I get there, let me explain my position here.

I'm not involved in creating dictionaries.

In terms of collecting new words, I do something similar to what a lexicographer does. I'm a historian of the English language, so I'm grateful to call it "research."

In teaching the history of the English language, I challenge my students to teach me two new slang words before class.

Over the years, I've picked up new slang words like this: "hangry" means "hungry, angry." "adorkable" means adorable, but a little dorky.

(Laughter) But if we treat them primarily as slang, and they're not yet in our dictionaries, how "sane" are these words?

With that in mind, let's turn the story into a dictionary.

Please raise your hand. Whether it's paper or online, how many of you still look up a dictionary on a daily basis?

it seems like almost everyone

Now for the next question. Raise your hands again. Has anyone ever seen who compiled the dictionary you use?

It decreased a lot

Somewhere in my head, I know that there are human hands involved in dictionaries.

there i am very interested

Even people who are known to be picky about dictionaries tend to be less picky about dictionaries and tend not to scrutinize differences between dictionaries or question their editors.

Think about it, the phrase "look up a dictionary" implies that all dictionaries are the same.

Consider this university library, where the reading room has a large unabridged encyclopedia that sits with honor and respect and is open to anyone who stands in front of it to find the answer.

Don't get me wrong, dictionaries are a very good source of information, but dictionaries are man-made and subject to the passage of time.

What strikes me as a teacher is that when we tell our students to always be aware of the issues they are reading and browsing, we tend to be vulnerable to dictionaries, forgetting about their authors, and thinking that dictionaries just appear out of nowhere and tell us the true meaning of words.

In fact, if you ask the compilers of dictionaries, they say their job is to keep up with the language changes we make.

They're looking at our spoken and written language to see what sticks and what doesn't stick.

This is a gamble. I don't want to be seen as cutting edge, and I don't want to divulge words like "LOL" that will become established later on, but I also don't want people to think that I've included words that are trendy and don't become established.

I'm in contact with the lexicographers, and you'd be surprised to hear where we meet.

Every January, we go to the Annual Meeting of the Dialect Society of America, where we vote for "word of the year."

There are about 200 to 300 people, including some of the country's leading linguists.

To tell you about the atmosphere of the place, the voting was organized just before the chat.

Anyone can participate

The most important rule is that you can only raise your hand once.

Words chosen in the past include, for example, "tweet" in 2009 and "hashtag" in 2012.

In 2000, it was "chad" (punched paper scraps from ballots), because nobody knew that word until 2000. In 2002, it was "WMD" (weapons of mass destruction).

There are other categories for voting, and my favorite is the one that picks the most creative word of the year.

Words that have been chosen in the past, for example, "recombobulation area," are places at Milwaukee Airport where confusion is recovered after security checks.

(Laughter) It's a place to retighten your belt and put your computer back in your bag.

My all-time favorite in this poll is "multislacking"

(Laughter) It's the act of opening a few windows on your computer screen and pretending that you're working, but you're actually playing on the web.

(Laughter) (Applause) Of course, not all of these words stick.

Some of them are even weird that they were chosen. For example, in 2006, the word of the year was "Plutoed," which means demotion.

(Laughter) But some of the words that were chosen now feel completely natural, like "app," the prefix "e," and the verb "google."

A few weeks before the dialect society vote, Lake Superior State University will release its list of "words to banish" for the year.

What's remarkable is that there's a pretty high degree of overlap between that list and the list of candidates for "word of the year" that we're looking at.

Both focus on words that have stood out.

I have a different opinion

Either you dislike linguistic fads and changes, or you find them interesting, interesting, and worthy of study as a feature of modern languages.

The Lake Superior State University list follows a very long tradition of dissatisfaction with neologisms.

These are the words of Archbishop Henry Alford in 1875. I am very concerned that the word "desirability" is really offensive.

In 1760, Benjamin Franklin wrote to David Hume that he would not use the word "colonize" because it was a bad word.

Concerns about new pronunciations have also been around for years.

Here's Samuel Rogers' 1855 quote, which he finds offensive, stresses the head, and worries about fashionable pronunciations: "'contemplate' is disgusting, but 'balcony' is nauseating."

(Laughter) The word "balcony" is borrowed from Italian, where the original pronunciation had an accent on the "co".

These complaints sound old-fashioned to us today, and I wouldn't go so far as to call them "adorkable" (Laughter).

In my office, I have a file of newspaper articles expressing concern that unorthodox words should not be included in dictionaries.

Some articles expressed concern about the noun "invite" and the verb "impact."

The compilers of dictionaries are not ignoring this view of language.

They're trying to give us guidance, usually in the form of annotations, about slang, informal words, words that might be considered offensive, but as editors it hurts because, while it's their job to explain what people say and do, they know that most people look up dictionaries to find out correct usage and appropriate expressions.

In response, the American Heritage Dictionary adds usage notes.

It's kind of a nasty word to have a warning attached to it, and one of the things that makes it nasty is the change in meaning.

There's a lot of human judgment involved in usage caution, and I think people who use dictionaries should be aware of these human judgments, but very little of them are.

I'm going to give you an example to explain what I mean, but first, let me explain what the editors are working on in this note.

Think about what you mean by the word "peruse."

What most people are probably thinking about is "swimming" or "reading quickly."

Some people might think of it in relation to walking, because we're talking about browsing the shelves in the grocery store.

You might be surprised, but when you look up the most standard dictionaries, the first words that come up are "to read carefully" and "to read carefully."

That's the first interpretation of American Heritage.

And the second interpretation is "to skim through," but it says "useful."

(Laughter) These notes here are worth reading.

Here's the caveat: "'peruse' has always meant 'peruse'.

But when used informally, it simply means "to read."

The broader meaning of "skimming" was traditionally considered a misuse, but our vote suggests it's becoming slightly more acceptable.

In 1988, 66% of respondents said that the statement ``I didn't have time and I just perused the manual'' was unacceptable, 58% in 1999, and 48% in 2011.

It's the Association of Experts, that those credible linguistic authorities are becoming more tolerant about this.

Everyone, please have your doubts "Wait, who are the intellectuals?"

"What should I do about their announcement?"

If you look at the front of the American Heritage Dictionary, you'll see the names of the members of the Society of Experts.

No one looks at the front matter of a dictionary, right?

About 200 people belong to the Society of Experts

It includes academicians, journalists, and literary writers.

We have Supreme Court justices, we have a few linguists.

I have been a member since 2005.

(Applause) What we can do for you

It's about trying to convey a range of meanings about the fluctuating phrasing.

That's our prerogative and we should stop there.

We are not a language academy

I get asked about once a year to vote on whether a new usage, a new pronunciation, a new meaning is acceptable.

Here's my voting criteria

listen to other people's spoken and written words

I don't listen to my linguistic likes and dislikes

I'll be honest with you, I don't like the word "impactful," but that's irrelevant. The question is whether "impactful" is commonly used and accepted in prose.

To answer responsibly, I check my grammar, and I often look at online resources like Google Books.

If you search for "impactful" on Google Books, you'll get these results.

It seems that "impactful" is becoming a practical term for a certain number of writers, and its utility has become more and more important over the last 20 years.

As languages ​​change, there will be things that not everyone will like.

I'm sure some of you will react like this, "Really?

Does language have to change like that? ”

My opinion is that we shouldn't be too quick to label a change as bad. We should be less quick to impose our likes and dislikes on other people's language, and not be too quick to accept the idea that English is in a bad state.

In fact, it's not. English is rich, powerful, and full of creativity from those who use it.

It's interesting to think now that "nice" used to mean "stupid," and "decimate" meant "kill 1 in 10 people."

(Laughter) It's silly that Franklin cared about the verb "notice."

But you know

Even those of us who worry about the verb "impact" and the noun "invite" will be considered idiots in a hundred years.

Languages ​​never change faster than we can keep up.

language doesn't work like that

I would like to ask all of you not to worry about language change, but to find it interesting and fascinating, like the compilers of dictionaries.

We want you to enjoy being a part of the creativity that keeps our language alive and constantly remaking it.

When does a word appear in the dictionary

If we use and continue to use, if we catch the attention of lexicographers.

If you're wondering, "So it's all of us who decide what words mean," my answer is, "Yes, that's right."

Dictionaries are great guides and sources of information, but there is no objective dictionary authority that can make the final judgment on the meaning of words.

If a community of speakers uses a word and everyone knows what it means, then the word is "sane."

It may be slang, it may be informal, it may seem illogical and unnecessary, but the language we use is "sane."

thank you

(applause)

Think of the difficult choices you'll face in the near future.

Between two professions, be an artist or an accountant, live in the city or in the country, marry one of the two, Betty or Lolita.

To have or not to have children Whether to adopt a sick parent What to do I am not interested in my partner's religion, but will I raise my children in that religion?

Donate your lifetime savings to charity or stay away

Perhaps the toughest choices you've come up with are big, big, and important to you.

It seems that difficult choices are those that bring bitterness, worry and gnashing of teeth.

But I think there's a misunderstanding about hard choices and the role they play in our lives.

Understanding the hard choices reveals the hidden power that each of us possesses.

What makes choices difficult is their relationship to other options.

For easy choices, some options are better than others.

In difficult choices, some options are better in some ways than others, others are better in other ways, and it's hard to say which one is better overall.

I'm stuck in my head and wondering whether to continue my current job and stay in the city, or to change my mind and move to the countryside and find a more rewarding job.

Hard choices aren't just about serious ones.

Let's say you're not sure what to eat for breakfast.

Fiber-rich cereal or chocolate donuts?

Let's say the point of choice is whether it tastes good or it's healthy.

Cereal is healthier, but donuts are much tastier, but overall it's a hard choice to say which one is better.

Knowing that even small choices can be difficult can motivate you to face bigger, harder choices.

Now that you can decide what to have for breakfast, you can decide whether to stay in the city or move to the country and find a new job.

And don't blame yourself for not being smart enough to make difficult choices difficult.

When I graduated college, I couldn't decide whether to go into philosophy or law.

I love philosophy

If you become a philosopher, you can learn great things and work comfortably in your armchair.

But I was born into a modest family of immigrants, and the only luxuries were pork tongue and jam sandwiches in my lunch box.

For me, it was an impression of wastefulness and extreme frivolity.

So I took out my notebook, drew a line down the middle, and wrote down as many reasons I could think of as why I should do and why I shouldn't, between the two options.

I remember thinking, I wish I knew what my life would be like if we went our separate ways.

If God or Netflix sent me a DVD of the course of two lives, I could decide and compare the two side by side.

Once you know which one is better, the choice becomes easier.

But I didn't get the DVD, and I didn't know which one was better, so I did what many people do when it comes to difficult choices: I took the safest route.

I became a lawyer out of fear that I wouldn't get a job as a philosopher, and then I realized that law wasn't the right fit.

I couldn't show my true self

Now I'm a philosopher, and I study hard choices, which is why I say that fear of the unknown is a common negative motivation for making hard choices, but it's rooted in a misconception about choice.

When you're faced with a difficult choice, it's a mistake to think that one option is better than the other.

Even if you put two options side by side and you know all the information, it's still hard to choose.

Hard choices are hard, not because we're ignorant, but because there's no such thing as the best choice.

Now, if there's no best choice, and if you weigh the options and they don't make a difference, then they must be equally good.

So when it comes to hard choices, it would be correct to say that every option is equally good.

it can't be

If all the options are equally good, you can flip a coin to decide.Is this thinking wrong?

There are other reasons why we think hard choices aren't just as good.

Let's say you have two career options: you can be an investment banker, you can be a graphic artist.

Many things come into play when making a choice, such as job excitement, financial security, and time spent raising children.

If you follow the path of an artist, you'll be at the forefront of new forms of pictorial expression.

If you follow the banker's path, you'll be at the cutting edge of a new form of financial technology.

Please think that you can't say which of the two jobs is better.

Now, let's condition one of the alternatives a little better.

Let's say the bank wanted you to come and added $500 to your monthly salary.

Has more money made the bank better than the artist?

not necessarily

As a banker, the higher salary makes it a better job than it was before, but maybe not so much that bankers are better than artists.

But if making one condition better doesn't make the other better, then the two jobs weren't equally good to begin with.

If you have two jobs that are equally good, and you improve the conditions in one, it should be better than the other.

When it comes to hard choices, that's not how it works.

I was troubled

have two jobs

I can't say which one is better, neither are they equally good

So how do you choose?

there seems to be an error somewhere

Is there a problem with the choice itself, and can't we compare?

But it can't be

I'm not trying to choose between two things that can't be compared.

You're weighing the merits of two jobs, not comparing the number 9 to the merits of a fried egg.

Comparing the overall value of two jobs is something we can, and in fact often do.

The source of my confusion, I think, is the assumptions we make about value.

Values ​​like justice, beauty, and kindness we inadvertently mix with scientific quantities like length, mass, and weight.

Consider a comparison that has nothing to do with value, for example, which of the two suitcases is heavier?

there are only three possibilities

one is heavier, lighter, or both weigh the same

Properties like weight can be represented by real numbers like 1, 2, 3, and when you compare two real numbers, there are only three possibilities.

Is one number greater, lesser, or equal to the other?

value is different

Born in the post-enlightenment age, we tend to think that scientific thinking holds the key to everything that matters in this world, but the world of values ​​is different from the world of science.

Things in one world can be measured in real numbers,

Things in the other world aren't like that.

Don't assume that the world of reality and length and weight and the world of moral obligations and ideals are the same structure.

If the joy of our children and the affection we have for our partners, which are so dear to us, can't be expressed in real numbers, then it doesn't mean that there are only three possibilities for choice.

We need a fourth relationship beyond good, bad, and to explain what happens in difficult choices.

I like to use "tie"

When the options are evenly matched, it matters which one you choose, but one isn't better than the other.

Rather, the options are all in the same value sphere, at the same value level, but the value content is very different.

That's why the choice is so difficult

When you understand difficult choices this way, you discover things about yourself that you didn't even know you had.

each of us has the power to create reasons

Imagine a world where you're faced with only easy choices, a world where there's always the best option.

If you have the best option, you should choose it. Because to be rational, you should do good rather than bad, and choose the option that gives you the most reasons to choose.

In such a world, there are many reasons why people choose to wear black socks rather than pink, eat cereal rather than donuts, live in the city rather than the countryside, and marry Betty, not Lolita.

In a world of easy choices, we become slaves to reason.

Come to think of it, based on the reasons someone gave me, it's crazy to believe that I got into this hobby and I live in this house and I do this job because it was the reason that was the most.

Instead, they made hard choices in the face of evenly matched options and created reasons for themselves to choose that hobby, that house, that job.

When the alternatives are even, the reasons given -- the reasons to decide which alternative is wrong -- don't guide the choice.

This difficult choice is where our power to set standards comes into play, the power to create our own reasons and transform ourselves into the people who deserve to choose country life over city life.

When we choose between evenly matched options, we can do some pretty amazing things.

You can make yourself the reason for your choices.

this is my place

This is who I am, aspiring banker.

choose a chocolate donut

These responses to difficult choices are rational responses, but they are not dictated by any given reason.

It's a reaction backed by a self-made reason.

When we decide that we're going to be this type of person instead of that type, and we create our own reasons why, we truly become who we are.

I guess you could say I become the author of my own life.

So when faced with a difficult choice, don't waste your time wondering which option is better.

there is no best option

Instead of looking for a reason outside, look for a reason within yourself. Who am I going to be?

You wear pink socks and decide to be a cereal-loving country banker, and I wear black socks and decide to be a donut-loving artist in the city.

It's up to us what we do when faced with difficult choices.

Now, a drifter is someone who doesn't exercise the ability to set standards when faced with difficult choices.

There are people who come to mind

I was swept away and became a lawyer

put aside one's subjectivity

I went on to become a lawyer, which I hadn't even set my sights on.

The castaway leaves the story of his life to the world.

Whether it's praise, fear, or choosing the easy path, we let the system of rewards and punishments decide our course.

What I've learned from making hard choices is where I put my agency and what I'm striving for.

Hard choices are never a source of anguish or anxiety, but rather a precious opportunity to celebrate and rejoice in what is special about human life.

That's why hard choices aren't bad luck, they're good luck.

thank you

(applause)

November 5, 1990 A man named El-Sayed Nosail visited a hotel in Manhattan and killed Jewish Defense League leader Rabbi Meir Kahane.

Nosail was initially acquitted of murder and served time on other minor charges, but in the meantime, he and his associates began plotting bombs against iconic New York City buildings, including tunnels, a Jewish church, and the United Nations headquarters.

Fortunately, these plans were foiled by FBI agents.

Unfortunately, the World Trade Center bombings of 1993 weren't stopped.

Nosail was later convicted of involvement in the bombing plot.

El Sayed Nosail is my father

I was born in 1983 in Pittsburgh, Pennsylvania, to an Egyptian engineer father and a loving American mother who was an elementary school teacher.

But when I was seven years old, my family started to change.

My father introduced me to a sect of Islam that few people -- even the majority of Muslims -- would ever meet.

In my experience, if you take the time to talk to people, you'll often quickly discover that we all want the same thing out of life.

But in every religion and race, there is a small percent of the fervent followers, a small percent of the fervent followers, who are determined to get others to do the same by any means necessary.

A few months before my father was arrested, he sat me down and said, "Recently, on the weekends, my friends and I were going to a shooting range on Long Island to practice shooting.

You will go tomorrow morning."

And then we went to the Culverton Shooting Range, which we didn't know was under FBI surveillance.

When it was my turn to shoot, my father let me put the rifle over my shoulder.

My last shot that day hit the little orange lamp above the target, and to everyone's surprise, especially myself, the target burst into flames.

My uncle said "Ibn Abuh" in Arabic to the other fellows.

"This father has this child"

Everyone laughed at this, but it took me a few years to finally understand its true meaning.

Everyone saw in me the image of my destructive father.

These men, who were later convicted, parked a van loaded with 700 kilograms of explosives in the underground parking lot of the North Tower of the World Trade Center Building and detonated it, killing six people and injuring more than 1,000.

this is what i respect

Uncles—they were called “ammu” and looked up to.

By the time I was 19, I had already moved 20 times. As a child, I moved from place to place, so I didn't have the opportunity to make many friends.I didn't have the opportunity to make many friends.

By the time we finally got along, we had to move to the next town.

Because I was always the new kid in my class, I was often the target of bullying.

I hid my identity so that I wouldn't be bullied by my classmates, but just being a quiet, chubby newcomer was enough of an attack.

So I spent most of my time at home reading books, watching TV, and playing video games.

So, to say the least, I was a socially awkward person, raised in a ideological household, and unprepared to leave the real world.

I was raised to judge people by arbitrary criteria, like race, religion, and so on.

So what changed me?

The first event that caused us to rethink this idea happened during the 2000 presidential election.

During my college prep program, I attended the National Student Council in Philadelphia I attended the National Student Council in Philadelphia.

My group was centered around youth violence, and I was particularly passionate about it, having been bullied most of my life.

The group was made up of people from a variety of backgrounds.

The meeting was nearing its end, and one day, I learned that one of my friends was a Jewish child.

We spent several days together in ignorance. Muslims and Jews are not destined to hate each other. Muslims and Jews are not destined to hate each other.

I hadn't had any Jewish friends before, and I was honestly proud of myself for overcoming this obstacle, which I had always thought was impossible.

The next big change for me was when I worked for a summer at an amusement park called Busch Gardens.

There, I met people of many different beliefs and cultures, and those experiences had a huge impact on my personality.

All my life, I've been taught that homosexuality is a sin, and that, by extension, being gay is a bad influence.

I was lucky enough to have the opportunity to work with gay performers at a show there. I had the opportunity to work with gay performers.

As a bullied child, I found it strange to face people who, although I've learned to empathize with others' pain in a way, are just much kinder than I'd like them to be.

That sense allowed me to match the stereotypes instilled in me as a child with real-life experiences and interactions.

I can't imagine how painful it is to be gay, but I know firsthand how painful it is to be judged for something you can't control.

And on "The Daily Show"

Watching John Stewart every night made me confront my own prejudices, and it made me realize that race, religion, and sexual orientation don't make a person good or bad.

I wanted a father so badly, and John was like a father in many ways.

Sometimes revelations come from unexpected places, and it was clear to me that my view of the world was more influenced and guided for good by a comedian than by my extremist father.

One day, I had a conversation with my mother about how my values ​​were changing.

With the weary eyes of a lifelong dogmatist, my mother looked at me with the tired eyes of a lifelong dogmatist and said, "I'm tired of hating other people."

In that moment, I realized how much energy was wasted holding on to hate.

Zach Ebrahim is not my real name

It's the name my family gave him when he decided to cut ties with his father and start a new life.

So why would I risk myself by making this confession?

it's easy

Because I hope that people who are being forced into violence will hear me, and people who are being forced into violence will hear me and realize that there are better ways to do things.

Instead, I chose to use this experience to fight terrorism and fight this prejudice.

It was for the victims of terrorism and their loved ones, and also for the intense pain and loss that terrorism inflicted upon them.

On behalf of the victims of terrorism, I stand firm against these cruel acts and condemn my father's actions.

With this simple fact, I can prove to myself that violence is not inherent in religion or race.

i'm not the father

Thank you (applause) Everyone, thank you (applause) Thank you (applause) Thank you very much (applause)

i am a lifelong traveler

Even when I was little, I managed to make it cheaper to go to a boarding school in England than to go to the best school beyond my parents' house in California.

So, since I was nine years old, a few times a year I've been flying alone over the North Pole to get to school.

Of course, the more I went on, the more I fell in love with flying, and the week after I graduated from high school, I got a mopping job to spend each season of my 18-year-old life on a different continent.

Inevitably, I would say, I became a travel writer, and work and fun became one.

And then I began to realize that if I was lucky, I could walk through the candlelit temples of Tibet, or stroll the waterfront of Havana, surrounded by music, and I could bring the sounds, the high cobalt skies, the shards of the deep blue sea back to my friends back home, bringing magic and clarity to my life.

But as we all know, the first thing you learn when you travel is that no place is attractive unless you look at it with the right eye.

If you take an angry man out into the Himalayas, he'll just start complaining about the food.

What I've found is that the best way to develop a watchful and appreciative eye is -- surprisingly -- not to go somewhere, but to stop.

Of course, sitting quietly is the most desperate need of modern busy people: rest.

Only this act can connect the past and the future in the slideshow of the busy life.

So, to my surprise, going nowhere is at least as exciting as going to Tibet or Cuba.

To go nowhere -- to just sit still for a few busy minutes every day, or a few days in each season, or, as some people do, for years of your life -- to seek out what moves you most and to remember where your true happiness lies.

This is what our predecessors have taught us, transcending time and culture.

It's an old idea

More than 2,000 years ago, the Stoic philosophers reminded us that what we do in life is what we do, not what we have experienced.

For example, let's say a typhoon hits your town and turns everything into rubble.

A man is traumatized for the rest of his life

But another person, even his brother, feels something close to liberation, seeing this as an opportunity to start over.

What happened to both of them was the same event, but very different reactions.

Like Shakespeare's "Hamlet," good or bad is determined by the way you think.

This is my experience as a traveler.

Twenty-four years ago, I took the most shocking trip ever, to North Korea.

The trip was several days.

What I'm doing is sitting quietly and going back in time in my head and thinking about it and making sense of it.

All in all, this trip has given me a great perspective, but sitting still turns this into a lasting insight.

I sometimes get the feeling that most of our lives happen in our heads, in our memories, in our imaginations, in our interpretations, in our speculations, and if you really want to change your life, it seems to me that if you really want to change your life, you should start by changing the way you think.

This is nothing new either. Shakespeare and Stoic philosophers have been saying for centuries that Shakespeare didn't have to deal with 200 emails a day.

(Laughter) And the stoic philosopher wasn't doing Facebook.

We are under pressure every day, but we are the ones who carry the most burden.

No matter where you are, day or night, you will be swayed by your boss, spam, and family.

Sociologists have found that in recent years, Americans are working less hours than they did 50 years ago, but we feel like we're working more hours.

Despite the increasing number of useful tools that save time, sometimes I feel like I just don't have enough time.

While it's easy to communicate with people far, far away on Earth, in the process, we sometimes lose the ability to hear our own inner voices.

As a traveler, one of the things that amazes me the most is that the people who got us to new places often find that they aren't going anywhere.

So the people who create the latest technologies that overcome many of the limitations of the past know the need for limitations, even when it comes to technology.

I've been to Google headquarters, and I've seen everything that many of you have heard of: indoor treehouses, trampolines, and employees at the time were enjoying 20 percent of their workdays as free time, where they were encouraged to let their imaginations run wild.

But what impressed me even more was that while I was waiting for my digital identity, a Googler told me about a program to train a large group of Googlers who practice yoga to become yoga instructors. did

Another friend of mine in Silicon Valley is Kevin Kelly, a very eloquent spokesperson for the latest technology, and former editor-in-chief of Wired magazine.

Kevin's latest book is about new technology, but he doesn't have a smartphone or a computer, and he doesn't have a TV at home.

Like many people in Silicon Valley, he's been trying to practice something called the Net Sabbath, where he's completely offline 24 or 48 hours a week so he can regain the sense of direction and balance he needs when he's back online.

What technology doesn't always provide is the wise use of technology.

Speaking of the Sabbath, let's take a look at the Ten Commandments. The Sabbath is the only word that uses the adjective "holy."

The Torah, the Jewish Bible, contains the Sabbath teachings in the longest chapter.

As we all know, one of the greatest luxuries is the nothingness.

Pauses and rests add color to the beauty and shape of most music.

As a writer, I often put a lot of white space in my books so that my readers' imaginations can breathe as they shape my thoughts and sentences.

Let's take a look at the physical realm. A vacation home is what a lot of people would love to have if they could afford it.

I don't think I'll ever get the chance to do that, but sometimes I'm reminded of the fact that I could always have a second home if I could.

Of course, it's not easy, and if you take the time to do this, you'll worry about all the things that might be in store for you the next day.

Sometimes it's tempting to give up food, sex, and wine and just want to check your email.

(Laughter) Each season, I try to take three days off, but I feel a little uncomfortable leaving my poor wife and ignoring urgent emails from my boss.

But once you find yourself in a quiet place, you realize that only by coming here can you find something new, creative, and amazing to share with your wife, your boss, your friends.

Otherwise, you're just exposing your exhausted and distracted disgrace.

So when I was 29, I decided to start my life over by not going anywhere.

One night, I was driving home from work, and I was in a taxi driving through Times Square after midnight, and suddenly it dawned on me that I was working so hard and not living my life well.

At the time, I was lucky enough to live a life that was closer to what I dreamed of as a boy.

I had some really great friends and colleagues, and I had a nice apartment on Park Avenue and 20th Street.

I had a fascinating career writing about world affairs, but what I didn't get to hear was to use my own voice to understand if I was truly happy.

And then, after abandoning my dream life, I found myself in a room in a backstreet in Kyoto, Japan.The place was filled with a powerful force, and I felt a very mysterious attraction.

Since I was a child, just looking at the paintings of Kyoto made me feel nostalgic, and I felt like I knew the place even before I went there.

As you all know, Kyoto is a beautiful city surrounded by mountains, with more than 2,000 temples and shrines, and people have been quietly standing there for over 800 years.

Shortly after I moved to Kyoto, I lived with my current family, my wife and children, in a two-room apartment on a nondescript street. I didn't have a bicycle, I didn't own a car, and I didn't have a TV that I could understand.

But at that time, the thing I valued the most was that you gave me time to myself.

Never used a mobile phone

I didn't even need to look at the clock at all.When I woke up every morning, what spread out in front of me was an infinite amount of time, like a meadow.

Sometimes life experiences unpleasant surprises -- it's more than a one-time thing. Whether it's a gloomy doctor coming into my room or I'm driving down the highway and another car slams me in. I'm pretty sure that time spent not going anywhere sustains me more than time spent cruising around Bhutan or Easter Island.

I'm a lifelong traveler, and it's the foundation of my life, and one of the beauties of travel is that doing nothing can lead to movement in the world.

I was on a plane in Frankfurt, Germany, and I had a friendly conversation with a young German woman sitting next to me for maybe half an hour or so, and then she turned around and sat there for 12 hours.

I never turned on the in-seat monitor, never read a book, never slept, just sat quietly.

What many people are doing consciously these days is to have space in their lives.

Some people go to a "black hole resort" and spend a few hundred dollars a night, and when they arrive, they leave their cell phones and computers at the front desk.

I know people who, instead of checking their messages or watching YouTube videos before going to bed, they just turn off the lights and listen to music, and they say that they sleep better and wake up refreshed.

I was lucky enough to drive up the high, dark roads of Los Angeles, where the great poet, singer, and international star Leonard Cohen once lived, and where he worked as a monk for many years, the Mount Baldy Zen Center.

It's no surprise to me that at the age of 77, his album, deliberately lamely titled "Old Ideas," went to No. 1 in 17 countries around the world, and reached the top five in nine countries.

Something inside of us craves what we get from those who, like them, take their time and dare to stand still

Isn't it familiarity and depth?

What most of us feel, or at least I do, is that we're standing five centimeters from a giant screen, and it's noisy, crowded, and ever-changing, and that screen is our life.

From there, you can step back, go farther, and then stop and you'll begin to understand the meaning of that canvas, and you'll be able to see it from a broader perspective.

There are people who are doing this by going nowhere.

In today's hectic world, nothing is more fun than taking it easy.

In today's distracted world, there is no luxury other than focus.

In today's busy world, there's nothing you can do but stop.

Now, I'm sure you're all going on your next vacation to Paris, Hawaii, New Orleans, and I'm sure you're having a great time.

But if you want to go home alive and hopeful and in love with the world, why not consider going nowhere?

thank you

(applause)

Architecture is really great, no doubt about it.

because architecture is art

But it's also an art in a weird place.

Because it's art at the cutting edge of the boundary between art and science.

Fertilization of architecture

daily life way of life

Need to be the driving force

great really great

And the life of an architect is just as wonderful.

The life of an architect requires you to be a poet at 10 o'clock in the morning, and this is for sure.

But at eleven o'clock, you have to be humanistic, or you'll lose your way.

By noon, I've got to be a builder.

You need to be able to build your own buildings, because architecture is ultimately the art of creating buildings.

Because architecture is the art of creating human dwellings.

limited to that

this is never easy

It's an amazing skill

Look at this

This is London, on top of The Shard.

This building was completed a few years ago.

They're trained workers, assembling the most advanced parts of this tower.

looks like a rock climber

it actually is

You're defying gravity, aren't you?

We brought together 30 of these people, and over 1,400 people from 60 countries came together on this site.

It's unbelievable. It's a feat.

Having over 1,400 people come together from all over the world is truly a feat.

A construction site is a testament to a great achievement

this is a different scene

Let's talk construction here

Construction is an adventure in the real world, not in the spirit.

This man is a deep sea diver

From rock climbers to deep-sea divers.

this is berlin

After the Wall fell in 1989, they built a building on Potsdamer Platz that connected East and West Berlin.

Nearly 5,000 people were involved in this project.

Nearly 5,000 people

This is a scene in Japan, building Kansai International Airport.

I used a rock climber here as well.I'm Japanese.

Building together is the best way to foster solidarity.

Pride is also born It is essential to have pride

Architecture, of course, is one of the reasons why architecture is so great.

But there's one more, even better reason.

Architecture is the art of building homes for the community, not just for the individual -- it's for the community and society at large.

Society never stops changing

the world is always changing

and people are reluctant to accept change

And architecture is a mirror that reflects that change.

Architecture expresses that change in the form of buildings.

The reason change is so difficult to embrace is that change creates adventure.

An adventure is born, architecture becomes an adventure

This is the Pompidou Center in Paris, quite a long time ago.

the time was 1977

It was like a spaceship that landed in the center of Paris.

At the time, my adventure buddy Richard Rogers and I were young rebels.

It's blue badass

(Laughter) It was only a few years after the May 1968 dissident movement.

So our architecture was also an act of rebellion, an act of pure rebellion.

The basic idea behind this building is to show that cultural architecture is not an intimidating entity.

What should arouse people's curiosity

That is the basis for creating a cultural facility.

curiosity is the beginning of a cultural attitude

There's a square there - you can see the square here.

The square is the starting point of city life

people meet in the square

and exchange experiences with each other

mixed age groups

By doing so, the essence of the city is naturally nurtured.

Since then, our office has created a lot of places for people.

A concert hall here in Rome

this is also a place for people

The inside of this building makes sounds, you know.

Playing with sound

This is Kansai International Airport in Japan.

Sometimes you need to make an island to build a building, so I made an island.

This building is over 1.6 kilometers long

It looks like a big glider landing on the ground.

this is san francisco

this is also a place for people

It's the building of the California Academy of Sciences.

On the roof of this building, instead of pumping water from groundwater, we planted thousands of plants that thrive on moisture in the air.

This roof is actually a living roof

The building has been awarded LEED platinum certification

LEED is an environmental performance evaluation standard for building sustainability.

This means that this place will be a place for people for many years to come.

this is new york

It's the new Whitney Museum in the Meatpacking District.

This is also a building that looks like an airplane.

this is also a place for people

This place is the Athens Niarchos Foundation Cultural Center

It's the foundation's library, it's an open space, it's a concert hall, it's a big park.

The building is also LEED Platinum certified.

The roof of this building collects the sun's energy

It's good to build a place for people

Building libraries and concert halls, building universities and museums is a good thing, because it's about creating a place that's open to everyone, available to everyone.

It's certainly a building for a better world.

And there's one more thing that makes architecture even better.

And that's because architecture not only responds to needs and necessities, but it also responds to desires, dreams and ambitions.

That's what architecture does

Even the humblest hut in the world does more than just provide a roof.

I have a role more than a roof

It tells a story, it tells the identity of the people who live in that hut.

of the individuals living there

Architecture is an art that tells a story

For example like this

The Shard, a glass tower in London

This building is the tallest building in Western Europe.

Soar over 300 meters and breathe the fresh air

The building's tilted surface reflects the London sky, and no two views are the same.

Everything turns blue when it rains

Everything turns red on a sunny evening

Words can't express it well

we call it Bill's soul

This picture on the left was in the Menil Collection long ago.

it's a museum

The photo on the right is the Harvard Museum of Art.

The two buildings play with light together

Light is one of the most important elements in architecture

this is amsterdam

This building plays with water

This is my office, but it faces the sea.

here you can play with work

I really enjoy working here

This cable car will take you up to the office.

This is the "New York Times Headquarters Building" in New York.

Here I am enjoying the bargaining with transparency

I also feel the presence of light and the presence of transparency.

On the left is the "Magic Lantern" in Japan, the Hermès building in Ginza, Tokyo.

This central photo is a monastery in the woods

Abbey is a game between silence and forest

Museum - It's a science museum.

This is based on the concept that emerges

This is in the center of Paris, inside the belly of a whale.

The Pathé Foundation in Paris

All these buildings have one thing in common, and that's something chasing aspirations and dreams.

this is me

(Laughter) Here's me on a yacht.

while playing with the wind

There was no particular reason for me to show you the photo.

(laughs) I tried to be a little pretentious.

But one thing is clear: I love sailing.

I also love designing yachts.

The reason I like sailing on a yacht is because it symbolizes a slow time.

and

quietness

And the feeling of floating in the air

And one more thing I can tell from this photo

to say i'm italian

(Laughter) It's a fact that cannot be changed.

(Laughter) I'm Italian and I love beauty.

i love beauty

So let's go on a yacht together, I'll take you somewhere, right here in the middle of the Pacific.

"Jean-Marie Tjibau Cultural Center"

A facility honoring the Kanak people

Located in Noumea, New Caledonia

this place is an art place

A place for art and nature

Buildings play with the winds Play with the trade winds

It makes a sound, the building speaks out too.

I'm showing you this picture because it's a symbol of beauty.

it's pure beauty

Let's talk a little bit about beauty

Beauty, like the bird of paradise, flies away the moment you try to catch it.

your arms are too short

But beauty is not a fancy concept