And she wrote beautiful songs.

In 2005, it was in the top five called "Beijing's 9 million bicycles".

This is a love story and she's like the Norah Jones of the UK, how much she loves her boyfriend and compares it to 9 million bikes and so on.

And she has this passage here.

(Music) (Lyrics) We're 12 billion light years away from the edge It's a guess No one can say it's true But I know I'll always be with you.

Michael Shermer: Well, that's good. At least she got close to it.

In America it would be "we are 6,000 light years from the edge".

(Laughter.) But my friend Simon Singh, a particle physicist turned science educator, author of books like The Big Bang, uses every opportunity to promote good science.

So he wrote an op-ed for The Guardian about Katy's song, in which he said:

You know, it's 13.7 billion light years, but that's not a guess.

We know how close it is, within an exact margin of error.

So it's not entirely true, but it's pretty close.

And to his credit, Katie called him after this op-ed came out and said,

I should have known better. ”

So we're done with the new version.

(music with lyrics) We are 13.7 billion light years away from the edge of the observable universe.

This is a good estimate with a well-defined margin of error.

And given the information available, I predict that I will always be with you.

(laughs) How cool is that?

My name is Joseph, Member of Parliament of Kenya.

Imagine a Maasai village. One night, government forces come and surround the village and ask each elder to take one boy to school.

That's how I went to school - almost a government man at gunpoint telling my father, "You have to choose."

It was very easy to walk to this mission school run by an American missionary.

The first thing the American missionaries gave me was candy.

Never in my life have I tasted candy.

So I told myself, along with hundreds of other boys, that this was where I belonged.

(Laughs) I left it.

When everyone else started dropping out.

my family moved. we are nomads.

It was a boarding school and I was seven years old. Every time the school closed, I had to travel to find it.

40-50 miles is fine.

You were sleeping in the bush, but you kept walking.

And I stayed. I don't know why, but I did.

Suddenly I passed the national exam and entered a very beautiful high school in Kenya.

and graduated from high school.

And just by walking I found a man who gave me a full scholarship to the United States.

My mother was still living in the cow dung barn and none of my siblings were in school, but the man said to me, 'Here you go.

I won a scholarship to St. Lawrence University in upstate New York. finished it.

After that, I went to graduate school at Harvard University. finished it.

Then I worked in Washington DC for a bit. I wrote books for National Geographic and taught American history.

And each time I went home and listened to their problems, sick people, waterless people, and everything else. I kept thinking of them every time I went back to America.

One day, an elder told me the following story. Long ago there was a great war between tribes.

This particular tribe really feared this other Ruhya tribe.

Each time they would send scouts to make sure no one was attacked.

So one day a scout ran and said to the villagers:

People hurriedly packed their bags and prepared to leave.

However, there were two men. One was blind and the other had no legs. He was born that way.

The leader of the chiefs said, "No, sorry. We cannot take you. You will slow us down."

We must run away from women and children, we must run away. ”

And they were left alone waiting to die.

But these two guys tried.

The blind man said, "Look, I am a very strong man, but I am blind."

The man with no legs says, "I can see the end of the world, but I can't protect myself from cats or any other animal."

The blind man thus knelt down, told the legless man to step over his back, and stood up.

The person above can see, and the blind can walk.

They set off and followed in the footsteps of the villagers to find and overtake them.

So this was told to me in the Elders setting.

And it's a really poor area.

I represent Northern Kenya, a remote area with the most nomadic population.

And the man said to me, "Well, here I am."

You got a good education in America and you live a good life in America. what will you do for us

We want you to be our eyes, we give you our feet.

We lead you and you lead us. ”

I got my chance. I was always thinking: "What can I do to help people?"

When you go to a region that has been independent for 43 years, it still lacks basic medical facilities.

The man has to be wheeled to the hospital in a wheelbarrow, 30 kilometers away.

There is no clean drinking water.

leave America.

I immigrated from the United States in June of last year and ran for election in July and won.

And I got them, that's my goal.

Now, for the past 9 months, I am planning to have clean drinking water for all nomads within 5 years.

We are building pharmacies throughout that constituency.

I am asking my friends from America to bring a nurse or a doctor to help me.

We are trying to improve our infrastructure.

I am using the knowledge I have from the United States and the community to push them forward.

I try to develop homegrown solutions to our problems because outsiders may come to our aid, but nothing can be done if we don't help ourselves.

My current plan to continue introducing students to a variety of fields, some becoming doctors and lawyers, is to produce an inclusive group of people who will see and support us in the growth of our community in the midst of a massive recession: returning students.

I will continue to be a member of Congress, and I will continue to hear you talking about botany, health, democracy, and new inventions, hoping that my little roadless community of 26,000 square kilometers, perhaps five times the size of Rhode Island, can one day be a model to help other communities develop.

thank you very much.

I spent the last two years dedicated to understanding how people achieve their dreams.

When we think about the dreams we have, and the scars we want to leave in the universe, we see how great an overlap there is between the dreams we have and the projects that never come to fruition.

(Laughter) So today I want to talk to you about 5 ways to stop chasing your dreams.

The first is believing in overnight success.

You know that story, right?

The engineer built a mobile app and sold it very quickly to make a lot of money.

This story may seem real, but it is incomplete.

Further research reveals that the guy has developed 30 apps so far and has master's and doctoral degrees on the subject.

He has been working on this subject for 20 years.

This is really interesting.

I myself have a story in Brazil where people think they became an overnight success.

I come from a poor family and started the application process two weeks before the MIT application deadline.

And here you go! It has entered.

People might think it was an overnight success, but the reason it worked is because I've been serious about life and education for the last 17 years.

Your overnight success story is always the result of everything you've done in life throughout the moment.

2: Trust someone else has your answer.

People always want to help, right?

All kinds of people—your family, friends, business partners—have opinions about which path you should take. "And, I tell you, go through this pipe."

But whenever you go indoors, you have to choose other ways.

And those decisions must be made by yourself.

No one else has the perfect answers for your life.

And you have to keep choosing those decisions, right?

You'll be banging your head because there are an infinite number of pipes, but that's part of the process.

Third, this is very subtle but very important. Decide to settle when growth warrants.

So when your life is going well, you put together a great team, your earnings are growing and everything is in order, it's time to settle down.

When I published my first book, I worked really hard to distribute it all over Brazil.

This resulted in over 3 million downloads and over 50,000 purchases of physical copies.

When I wrote the sequel, some impact was guaranteed.

Small sales are fine.

But OK is never OK.

When you're growing towards a peak, you have to work harder than ever to find the next peak.

Perhaps if I do even a little, hundreds of thousands of people will read it, and that's already great.

But if we work harder than ever, we can increase this number to millions.

That's why I decided to go to all the states of Brazil with my new book.

And we can already see the high peaks.

There is no time to settle down.

Fourth tip, this is very important. It is to believe that responsibility lies with others.

I often hear people say, “Yes, I had a great idea, but no one had the vision to invest in it.”

"Oh, I made such a wonderful product, but the market was bad and it didn't sell."

Or, "I can't find good people. My team is falling short of expectations."

If you have a dream, it is your responsibility to make it come true.

Yes, talent can be hard to find.

Yes, the market can be bad.

But if no one invested in your idea, no one bought your product, then surely there is your fault.

(laughs) Yes.

You gotta dream and make it come true.

And no one has achieved their goals alone.

But if you can't make it happen, it's your fault, no one else's.

Take responsibility for your dreams.

And one last tip, which is also very important. Believe that the only thing that matters is the dream itself.

One day, I saw an advertisement that many of my friends were going to climb a mountain, but it was a very high mountain and hard work.

I knew I was sweating, and it was hard.

They climbed higher and higher until they finally reached the top.

Of course they decided to celebrate, right?

I'm going to celebrate, so I say, "Yes, I succeeded, I'm at the top!"

After 2 seconds, one person looks at the other person and says, "Okay, let's go down."

(Laughter) Life is never the goal itself.

Life is a journey.

Sure, you should enjoy the goals themselves, but people think you have dreams, and if you can reach any of them, it's a magical place of happiness.

But realizing a dream is a temporary impression, not your life.

The only way to truly fulfill all your dreams is to truly enjoy every stage of your journey.

That's the best way.

And your journey is simple - it consists of steps.

Some steps can be done immediately.

Sometimes I stumble.

If it's right, let's celebrate. Because some people wait a long time to celebrate.

If you stumble, turn it into a learning.

If every step becomes something to learn or something to celebrate, the journey will be a joy.

Here are five tips. Believe in overnight success, believe that someone has the answer, believe that you should settle down when growth is guaranteed, believe that someone else is to blame, believe that only the goal itself matters.

Believe me, it will destroy your dreams.

(Laughter) (Applause) Thank you.

We humans have always been very concerned about our physical health, but we haven't always been good at understanding what's important.

Take the ancient Egyptians for example. I was very concerned about the body parts that I thought would be necessary for the afterlife, but I omitted some parts.

For example this part.

They very carefully preserved the stomach, lungs, liver, etc., but only the brain was mumbled, expelled through the nose, and discarded. This really makes sense. What does the brain do for us in the first place?

But imagine if there was a certain organ in our body that weighs as much as our brain and is in some ways as important as we are, yet neglected. But we knew very little about it and were treated with such disregard.

And what if, with new scientific advances, we began to understand the importance of science to how we think about ourselves?

Interested in learning more?

Well, it turns out that there is just such a thing in our intestines. It's our gut, or its microbes.

But it's not just the microbes in your gut that matter.

It turns out that the microbes in our bodies are crucial to the many differences that make us different humans.

For example, have you ever noticed that some people get bitten by mosquitoes more often than others?

Everyone's anecdote at camp actually turned out to be true.

For example, I rarely get mosquito bites, but my partner Amanda attracts a lot of them. The reason is that our skin has different microbes that produce different chemicals that mosquitoes sense.

Microorganisms are also very important in the medical field.

So, for example, what microbes are in your gut determines whether a particular pain reliever is toxic to your liver.

It also determines whether other drugs work for the heart condition.

And, at least in fruit flies, microbes determine who they want to have sex with.

We haven't demonstrated this in humans yet, but perhaps it's only a matter of time before we find out. (Laughter) So microbes perform a very wide range of functions.

They help us digest food.

They help educate our immune system.

They help us fight disease and may even influence our behavior.

So what would a map of all these microbial communities look like?

Well, it doesn't look exactly the same, but it's a useful guide to understanding biodiversity.

Different regions of the world have different biotic landscapes that immediately characterize the location.

To be honest, microbiology is no different. Under a microscope, all microbes look basically the same.

So instead of trying to identify them visually, what we do is look at their DNA sequence. In a project called the Human Microbiome Project, the NIH funded this $173 million project. The project brought together hundreds of researchers to map A, T, G, C, and all these microbes in the human body.

So when you put them together you get something like this:

Now it's a little harder to know who lives where, isn't it?

What my lab is doing is developing computational techniques that can take all these terabytes of array data and turn them into something a little more useful as a map. So if we do that with human microbiome data from 250 healthy volunteers, we get:

Each point here represents all complex microbes in the entire microbial community.

See, I told you that basically they all look the same.

We therefore note that each point represents one microbial community from one body site in one healthy volunteer.

You can see that different parts of the map are displayed in different colors, almost like separate continents.

It turns out that different areas of the body have completely different microbes.

So what we have is we have a green oral community out there.

On the other side, the skin community is shown in blue, the vaginal community in purple and, just below, the fecal community in brown.

And over the last few years, we've discovered that the microbes in different parts of the body are surprisingly different from each other.

Therefore, if we look only at the microbes in a person's mouth and gut, we see a very large difference between these two microbial communities.

That's more than the difference between this coral reef microbe and this grassland microbe.

So when you think about it, this is incredible.

What that means is that a few feet difference in the human body makes a bigger difference in microbial ecology than hundreds of miles on the planet.

And this is not to say that two people in the same internal environment look basically the same.

I mean, you've probably heard that in terms of human DNA, we're pretty much the same.

You and the person sitting next to you are 99.99 percent identical in terms of human DNA.

However, this is not the case for gut microbes. You may only have 10% similarities with the person sitting next to you when it comes to your gut microbiome.

So it's as different as this grassland bacterium and this forest bacterium.

These different microbes all have different types of functions, from digesting food to being involved in different types of diseases, metabolizing drugs, and more.

So how do they do this?

That's partly because there are only 3 pounds of microbes in our gut, yet they actually outnumber us.

So how much do they outnumber us?

Well, it depends on how you think of our bodies.

Could it be our cells?

We humans are made up of about 10 trillion cells, but we have 100 trillion microbial cells.

So they outnumber us by 10 to 1.

Now, you might think we're human because of our DNA, but it turns out that each of us actually has about 20,000 human genes, depending on how many we counted, but we also have 2-20 million microbial genes.

So, whichever way you look at it, we outnumber our commensal microbes by a lot.

It turns out that in addition to imprints of human DNA, there are also imprints of microbial DNA on everything we touch.

A few years ago, we showed that we could actually match a person's palm to the computer mouse they use every day with up to 95% accuracy.

This was published in a scientific journal a few years ago, but more importantly, it was featured in CSI: Miami, so we know it's true.

(Laughter) So where did our microbes come from in the first place?

Now, if you, like me, have dogs or children, you probably have dark suspicions about it, but by the way, they're all true.

So, just as we can match you and your computer device by the microbes you share, we can also match you and your dog.

However, microbial communities have been found to be relatively stable in adults, so that even if they live together, they will maintain separate microbial identities for weeks, months, and even years.

It turns out that our initial microbial communities are highly dependent on how we were born.

So a baby who comes out in a normal way basically has all the microbes like the vaginal community, whereas a baby delivered by caesarean section has all the microbes like the skin.

And this may be related to some of the health differences associated with caesarean births, such as increased asthma, more allergies, and even more obesity. All of these are now associated with microbes. Come to think of it, until recently, all surviving mammals were born via the birth canal. As such, the lack of protective microbes with which we have co-evolved may be crucial for many of the diverse conditions now known to involve the microbiome.

When my own daughter was born by emergency caesarean a few years ago, we took matters into our own hands and made sure she was covered in vaginal microbes that she would have naturally acquired.

Now, it's very difficult to tell if this specifically affected her health, right?

With a sample size of only one child, no matter how much we love her, we don't have a large enough sample size to get an idea of ​​what happens on average. However, she is 2 years old and has not yet had an ear infection, so we are keeping an eye on this issue.

Additionally, we are starting clinical trials with more children to see if this is generally preventive.

So how we are born has a huge impact on what microbes we have in the beginning, but where do we go after that?

Shown here again is this map from the Human Microbiome Project data. Each point therefore represents a sample from 1 body part from 1 out of 250 healthy adults.

And I have seen my children grow physically.

I have seen them grow spiritually.

Well, this is the first time I've seen one of my colleague's children develop microbiologically.

So what we're going to look at is this one baby's stool sampled weekly for almost two and a half years, a group of stools representing the intestine.

And it starts from day one.

What happens next is that the infant starts with this yellow dot. You can see that it basically starts in the vagina, as expected from the mode of delivery.

And what happens in the next two-and-a-half years is that he travels all the way down, moving through the faecal community of healthy volunteer adults to the lower reaches.

So let me start with this and see how it goes.

Keep in mind that each of these steps only takes a week. We find that this week-to-week change in the faecal microbial community of one child is much larger than the difference between individual healthy adults in the Human Microbiome Project cohort. This is the brown dot at the bottom.

And we see him starting to get closer to the adult poop community.

This is a maximum of 2 years.

But something amazing is about to happen here.

So he's getting antibiotics for an ear infection.

What we see here is this major change in the community and the relatively rapid recovery that followed.

Rewind it.

And what we see is a much more radical shift in the last few weeks, months of setbacks in normal development, followed by a relatively rapid recovery, and by the time we reach the end of this video, day 838, we see him reaching an essentially healthy adult stool community despite antibiotic intervention.

This raises a fundamental question of what happens when we intervene in a child's life at different ages, which is very interesting.

So does what we do in the early stages of a rapidly changing microbiome actually matter, or is it like throwing a stone into a stormy sea whose ripples only disappear?

Interestingly, children given antibiotics during the first six months of life were more likely to become obese later in life than those who were not given antibiotics at that time or given them later. So what we do early on can have a significant impact on the gut microbial community and subsequent health, which we are only beginning to understand.

This is interesting. Because in addition to the significant impact of antibiotics on antibiotic-resistant bacteria, antibiotics can also degrade our gut microbial ecosystem. So one day we may have the same fear of antibiotics that we now have of the metal tools that the Egyptians used to grind the brain before extracting it from the brain for embalming.

I said that microbes have all these important functions, but in the last few years they have also been implicated in various diseases such as inflammatory bowel disease, heart disease, colon cancer and even obesity.

Obesity has been proven to have a real impact, and today, by looking at the microbes in your gut, you can tell with 90 percent accuracy whether you're underweight or obese.

This may sound impressive, but in some ways it's a bit problematic as a medical test. Because you can probably tell which of these people is obese without knowing anything about their gut bacteria. But it turns out that even if they had their complete genomes sequenced and had all the human DNA, they could only predict which people would be obese with about 60% accuracy.

That's awesome, right?

Depending on your health, the three pounds of microbes you carry around could be more important than all the genes in your genome.

And you can do even more with your mouse.

As such, in mice, microbes have been found to be associated with all sorts of further diseases, including multiple sclerosis, depression, autism and even obesity.

But how can we determine whether these microbial differences that correlate with disease are cause or effect?

One thing we can do is keep a few mice in a sterile bubble without the microbe itself.

Now let's add some microbes that we think are important and see what happens.

When microbes are harvested from obese mice and transplanted into genetically normal mice raised in microbe-free bubbles, they become fatter than when microbes are harvested from normal mice.

But it's quite surprising why this happens.

Sometimes it happens that microbes are helping them digest food more efficiently from the same diet, taking in more energy from food, and sometimes microbes actually influence their behavior.

They eat more than normal mice, so feeding them all they want will only make them fat.

This is really remarkable, isn't it?

This means that microbes can influence mammalian behavior.

So you might be wondering if something like this is possible across species. When microbes are harvested from obese individuals and transplanted into germ-free mice, the mice also become fatter than when microbes are ingested from lean individuals. However, we can engineer a microbial community that prevents that weight gain and inoculate it with those organisms.

You can also do this for malnutrition.

So, in a project funded by the Gates Foundation, we are looking at children in Malawi suffering from kwashiorkor, a severe malnutrition, where mice transplanted with kwashiorkor congregations lose 30 percent of their body weight in just three weeks, but can be restored to health by using the same peanut butter-based supplements used for children in clinics, and transplanted congregations from healthy identical twins of kwashiorkor children. mice can recover their health. OK.

This is really amazing. This is because it suggests that treatments could be piloted in a large number of different mice with individual people's intestinal communities, possibly allowing customization of those treatments down to the individual level.

Therefore, I think it is very important that everyone has the opportunity to participate in this discovery.

So a few years ago we started this project called American Gut. This will allow you to claim your place on this microbial map.

This is currently the largest crowdfunded science project we know of, with over 8,000 people participating so far.

What happens is they send the sample, we sequence the DNA of their microbe and send the results back to them.

We also anonymize and publish the data to scientists, educators, interested members of the public, etc., making the data accessible to everyone.

On the other hand, after a tour of the BioFrontier Laboratories lab and the explanation that they use robots and lasers to observe poop, it becomes clear that not everyone wants to know.

(Laughter) But I'm sure many of you feel the same way, so here are some kits for those of you who want to try it yourself.

So why should we do this?

Well, it turns out that microbes are not only important for knowing our health, they can actually cure disease.

This is one of the latest things that my colleagues at the University of Minnesota and we were able to visualize.

Here is a map of the human microbiome.

What we're currently considering -- we'll add to the community of some people with C. diff.

So this is severe diarrhea that can occur up to 20 times a day, and these people had failed antibiotic treatment for two years before being included in this trial.

So what would happen if we transplanted some of the stool (asterisked below) from a healthy donor into these patients?

Can good microbes fight bad microbes and help restore health?

Let's see exactly what happens there.

Four of those patients are about to receive a transplant from the bottom healthy donor. And we soon find that a fundamental change is taking place in the gut community.

So, the day after the transplant, all these symptoms subside, the diarrhea disappears, and they are basically healthy again, resembling the donor community and staying there.

(Applause.) So we're only at the beginning of this discovery.

We are discovering that microbes play a role in all kinds of diseases, from inflammatory bowel disease to obesity to autism and depression.

But what we have to do is develop a kind of microbial GPS. Not only do you know where you are now, but you also know where you want to go and what you need to do to get there. It should also be easy enough for a child to use. (laughs) Thank you.

(applause)

As a software developer and engineer, I have worked on many public technology projects over the years.

Civic tech is sometimes referred to as technology for good, using technology to solve humanitarian problems.

This was in 2010 in Uganda when I was working on a solution that would allow locals to bypass government surveillance on their mobile phones when they voiced their dissent.

The same technology was later introduced in North Africa for a similar purpose, allowing activists to maintain connectivity when governments intentionally shut it down as a means of population control.

But over the years, as I've been thinking about these technologies and what I'm working on, certain questions have stuck in the back of my mind. What if we're wrong about the strengths of technology, and sometimes it actively harms the communities we're trying to help?

Tech industries around the world tend to operate on the same premise that building great things has a positive impact on everyone.

Ultimately, these innovations will be out there for everyone to see.

However, this is not always the case.

I like to paraphrase this technology advocacy as "trickle-down technonomics." (Laughter) We tend to think that if we design things for a select few people, eventually those technologies will reach everyone, but that's not always the case.

Technology and innovation are much like wealth and capital.

They tend to be concentrated in the hands of a few people and sometimes in the hands of many.

Most of you don't go up against oppressive regimes over the weekend, so I thought I'd come up with a few examples that are a little more relatable.

In the world of wearables, smartphones and apps, there is a big movement to track people's personal health with applications that track calories burned, how much they sit, how much they walk, and more.

These technologies have significantly streamlined patient admissions in healthcare facilities, and healthcare facilities are beginning to expect these types of efficiencies.

When these digital tools are introduced into the medical room and become digitally enabled, what happens to the digital and invisible?

What would the medical experience be like for someone who didn't have a $400 cell phone or a watch to track all their movements?

Are they now a burden on the health system?

Has their experience changed?

In the world of finance, bitcoin and cryptocurrencies are revolutionizing how money moves around the world, but the challenge with these technologies is that the barriers to entry are incredibly high.

You can find a surrogate agent in locations where you don't need access to the same phones, devices and connections. A surrogate agent usually requires some capital to participate.

So the question I ask myself is, when the rest of the world moves to digital currencies, what happens to the last communities that used paper money?

Another example from my hometown of Philadelphia. I recently went to the public library there, and the library is facing an existential crisis.

With public funding dwindling and a smaller footprint needed to stay open and relevant, one way they are tackling this is by digitizing and moving large numbers of their books to the cloud.

This is great for most children. right?

You can borrow books from home and do research on your way to and from school, but these are really two big prerequisites. One is access from home and the other is mobile access. In Philadelphia, not many kids have it.

So what will their educational experience look like in the wake of a fully cloud-based library, once considered a fundamental part of education?

How do they stay competitive?

It is the last example in the world in East Africa. There is a massive movement to digitize land titles for a variety of reasons.

Immigrant communities, a dying older generation, and ultimately poor record keeping have created conflicts over who owns what.

So there has been a big move to put all this information online, track all these land titles, store them in the cloud and make them available to the community.

But in fact, as an unintended consequence of this, venture capitalists, investors and property developers swooped in and started buying up these lands from under these communities. Because they have access to the technology and connections that make it possible.

This is the common thread that connects these examples, the unintended consequences of the tools and technologies we create.

As engineers and technicians, we sometimes prioritize efficiency over efficiency.

We think about doing things more than the consequences of what we are doing.

This has to change.

We have a responsibility to think about the consequences of the technology we build. Especially as technology increasingly controls the world we live in.

In the late 90's there was a big movement for ethics in the investment and banking world.

In 2014, I think we were eagerly awaiting a similar move in tech and technology.

So, as an entrepreneur, as a CEO, as an engineer, as a maker, when you're thinking about the next big thing, I encourage you to think about the unintended consequences of what you're building. Because real innovation lies in finding ways to get everyone involved.

thank you.

(applause)

(Rainforest noise) In the summer of 2011, I visited Borneo's rainforest for the first time as a tourist. As you can imagine, what struck me most was the overwhelming sound of the forest.

A constant cacophony of noise is heard.

Some really stand out.

For example, this is a large bird, a hornbill.

This cry is a cicada.

This is a family of gibbons.

In reality, they are singing to each other at great distances.

The place where this was recorded was actually a gibbon sanctuary, so you can hear so many gibbons, but in fact the most important noise coming from the forest at the time was one that I didn't notice, and in fact no one there did.

As I said earlier, this was a sanctuary for gibbons.

They spend most of their time rehabilitating gibbons, but they have to spend more time protecting their communities from the illegal logging that goes on alongside them.

So, taking the forest sounds and ignoring the actual gibbons and insects and other animal voices, the recordings you heard had chainsaws in the background all the way away.

They have three full-time guards stationed around the reserve, and their job was really to prevent illegal logging. One day we went out for a walk in the forest again as tourists. After walking less than five minutes, I met someone sawing down a tree just a few hundred meters from the ranger station.

As you heard, the forest was so, so loud that they couldn't hear the chainsaw.

In this day and age, I found it totally unacceptable that someone with a chainsaw could fire just a few hundred meters from a ranger station in a reserve and no one could actually hear it.

It seems improbable, but in fact it was absolutely true.

So how can illegal logging be stopped?

As an engineer, it's very tempting to always come up with high-tech, very crazy high-tech solutions, but really, you're in a rainforest.

It should be simple and extensible. So we found out there that everything we needed was already there.

You could build a system that could prevent this using what you already have.

who was there? What was already in the forest?

Well, there were people.

There was a dedicated group there, three full-time guards, dedicated to stopping it, but they just needed to know what was going on in the woods.

What really surprised me, and this was the biggest surprise, was that I was able to connect in the woods.

There was cell phone service in the middle of nowhere.

Hundreds of kilometers from the nearest road and certainly no electricity, but cell phone service was very good. People in town are always on Facebook and surfing the web on their mobile phones. This led me to think that it might be possible to use forest sounds to programmatically pick up the sounds of chainsaws. Because people can't hear it.

But you need equipment to climb trees.

So if I could use some device to listen to forest sounds, connect to the cellular network there, and send warnings to people on the ground, I could probably solve this problem for them.

But let's take a moment and talk about protecting rainforests. Because it's something we've all heard about forever.

People of my generation have heard about saving the rainforest since we were kids. And the message doesn't seem to have changed. We have to save the rainforest, it is very urgent, yesterday so many football fields were destroyed.

But we are here today, with about half of our rainforest left, and we may have more pressing issues like climate change.

But actually, this is a little-known fact that I was unaware of at the time. Deforestation accounts for more greenhouse gases than all the planes, trains, cars, trucks and ships in the world combined.

It is the country with the second highest rate of contribution to climate change.

And according to the International Criminal Police Organization, 90% of the logging that takes place in the rainforest is as illegal as we've seen.

So if we can help forest people to comply with the rules out there, it can actually eat up a lot of that 17 percent and have a big impact in the short term.

It may be the cheapest and fastest way to combat climate change.

This is the system we imagine.

It looks super high tech.

As soon as the sound of a chainsaw is heard in the woods, the device will pick up the sound of the chainsaw and send an alert to rangers in the field through the standard GSM network that already exists. Rangers can actually appear in real time and stop logging.

No more searching for felled trees.

Real-time intervention is important, not satellite viewing of trees in clearcut areas.

That's why I said it would be the cheapest and fastest, but in reality, as you can see, I couldn't actually do it, so it may not be so cheap and fast.

But if the device in the tree was actually a cell phone, it could be a lot cheaper.

Hundreds of millions of mobile phones are thrown away every year, and hundreds of millions are thrown away in the United States alone, excluding the rest of the world. Of course we should, but cell phones are actually great.

Sensor is full.

They can hear the sounds of the forest.

we must protect them.

You need to put them in the box here and power them.

Powering them is one of the big engineering challenges we had to deal with. That's because powering mobile phones under tree canopies and generating solar power under tree canopies were still unsolved problems. That's the unique solar panel design seen here, which is in fact also made from recycled by-products of industrial processes.

These are cut strips.

In fact, this is me putting everything together in my parents' garage.

I am very grateful to them for allowing me to do so.

As you can see, this is the device on the tree.

Perhaps what you can see from here is that they are well hidden in the distant canopy.

This is important. Because the noise of a chainsaw can be heard up to a kilometer away and has a range of about 3 square kilometers, but if someone removes the chainsaw, the area is vulnerable.

So does it actually work?

Well, to test it, we brought it back to Indonesia. Not the same place, but a different one, another gibbon sanctuary that is threatened daily by illegal logging.

On the second day there was an illegal chainsaw noise.

I was able to get real-time alerts.

I received an email on my cell phone.

Actually, we had just climbed that tree. They had just come back down.

Everyone was smoking, then an email came, and everyone went quiet. In fact, you can hear the chainsaw really faintly behind you, but no one noticed it until that moment.

So we set out to actually stop these loggers.

I was quite nervous.

This is the moment we actually arrive near where the loggers are.

This is the moment I realize I probably really regret the whole effort.

I'm not quite sure what lies beyond this hill.

That person is much braver than I am.

But since he was gone, I was forced to go, and I climbed up on foot. And indeed he crossed the hill and interrupted the work of the woodcutters.

For them it was such a surprise - they had never been interrupted before - it was such an impressive event for them that we heard from our partners that they have not been back since.

They were, in fact, wonderful people.

They showed us how the whole operation works. What really convinced us on the spot was that being able to show up in real time and deter people was enough of a deterrent to keep them from coming back.

So -- thank you. (Applause.) Perhaps because we told so many people, the rumors spread, and really amazing things started to happen.

People from all over the world started sending us emails and phone calls.

What we've seen is people all over Asia, people all over Africa, people all over South America telling us they can use it too. And most importantly, what we discovered, which we thought might be the exception, was that there was pretty good cell phone service in the woods.

We were told that it was not the exception, especially in the margins of the most threatened forests.

And then something really amazing happened. That's what people started sending us their old cell phones.

So really what we have now is a system that can take advantage of people on the ground, existing people who can improve and take advantage of existing connections. We use old mobile phones sent to us by people all over the world who want their phones to do something else in the afterlife, so to speak.

And if the rest of the device can be fully recycled, it is considered a fully upcycled device.

Again, this was not brought about by any high tech solution.

It was born out of using what was already there. I'm completely confident that there will always be enough out there to build similar solutions that are very effective in new situations, even if it's not a phone.

thank you very much.

(applause)

25 years ago CERN scientists created the World Wide Web.

Since then, the Internet has changed the way we communicate, do business, and even live.

The ideas that gave birth to Google, Facebook, Twitter, and many others are transforming our lives in so many ways, bringing us many real benefits, such as a more connected society.

However, this also has some drawbacks.

Today, the average person possesses an astounding amount of personal information online, and this online information is added to with every Facebook post, Google search, and email sent.

Now, many of us are probably thinking that one email didn't say anything.

But when you consider a year's worth of emails, or a lifetime's worth of emails combined, it says a lot.

It tells us where we've been, who we've met, and in many ways, even what we're thinking.

And what's even scarier about this is that our data lives forever, so yours could and will outlive yours.

What happened is that we have pretty much lost control over our data and privacy.

So, as the web turns 25 this year, it's very important that we take a moment to think about what impact this will have on us.

I really have to think about it.

Yes, we have lost our privacy, but what we have really lost is the very concept of privacy.

Come to think of it, most of us here today probably remember what life was like before the Internet. But now there is a new generation who are being taught from an early age to share everything online. And this generation will not remember a time when data was private.

So we will continue down this path, but 20 years from now the word “privacy” will mean something very different than it means to you or me.

So let's take a moment and see if there's anything we can do about this.

And I believe it is.

Let's take a look at one of the most widely used forms of communication in the world today, email.

Before the invention of email, we communicated primarily through letters, and the process was very simple.

First, write a message on a piece of paper, put it in a sealed envelope, put a stamp and address on it, and send it.

Unfortunately, when we actually send an email today, we're not sending a letter.

What you're sending is really a postcard in many ways, and a postcard in the sense that everyone who sees it can actually read the entire contents until it's sent from your computer to the recipient.

So the solution to this has been known for quite some time and many attempts have been made to implement it.

The most basic solution is to use encryption, and the idea is very simple.

First, encrypt the connection between your computer and your email server.

Then we also encrypt the data on the server itself.

However, there is a problem with this. In other words, the email server also holds the encryption key, so there's a very large lock with the key right next to it.

But that's not all, any government can legally request and get a key to your data, and it's all done without your knowledge.

So the way to solve this problem is actually relatively easy in principle. Give everyone their own key and then verify that the server doesn't actually have the key.

This seems like common sense, right?

The question that arises then is why this has not yet been done.

A closer look reveals that today's Internet business model is not really compatible with privacy.

A look at some of the big names on the web shows that advertising plays a big role.

In fact, with advertising reaching $137 billion this year alone, companies need to know everything about us in order to optimize the ads they show us.

They need to know where we live, how old we are, what we like, what we don't like, and whatever else they can get their hands on.

Come to think of it, the best way to get this information is simply to violate our privacy.

Therefore, these companies do not intend to provide us with privacy.

If we want privacy online, all we have to do is go out and do it ourselves.

For many years, when it came to email, the only solution was known as PGP. It was very complex and accessible only to the tech savvy.

Below is a diagram that basically shows the process of encrypting and decrypting a message.

Needless to say, this is not a solution for everyone. Actually this is part of the problem. Because when you think about communication, by definition you need to have someone to communicate with.

So while PGP serves its design purpose admirably, for people who don't understand how to use it, the option to communicate privately doesn't exist at all.

And this is the problem we have to solve.

So if you want to have privacy online, the only way you can be successful is to get the whole world on board. This is only possible if the barriers to entry are lowered.

In fact, I think this is a key issue that lies within the tech community.

What we really need to do is work and make privacy more accessible.

So when Edward Snowden came up last summer, a few colleagues and I decided to see if we could make it happen.

By the way, at the time we were working at the European Organization for Nuclear Research, the world's largest particle collider for proton collisions.

We were all scientists, so we used our scientific creativity to come up with a very creative name for the project: "ProtonMail." (Laughter) A lot of startups these days actually start in people's garages and basements.

we were a little different.

We started in the CERN cafeteria. It's really nice here. Because we have all the food and water we need.

But even better than this is every day between 12:00 and 12:00. It's free at 2pm, and thousands of scientists and engineers are in the CERN cafeteria, and they basically know all the answers.

We started working in such an environment.

What we really want to do is take your email and transform it into something similar to this, but more importantly, we want to do it in such a way that you don't even know it happened.

So it really takes a combination of technology and design to make this happen.

So how do we do something like this?

Well, it's better not to put the key on the server.

So what we do is generate an encryption key on our computer. Instead of generating a single key, you actually generate a set of keys. So you have an RSA private key and an RSA public key, which are mathematically related.

Now let's see how this works when multiple people communicate.

Here we have Bob and Alice who want to communicate privately.

The key challenge, therefore, is to take Bob's message and deliver it to Alice in a way that the server cannot read it.

So what we have to do is that the data needs to be encrypted before it leaves Bob's computer. One trick is to encrypt it with a public key from Alice.

This encrypted data is sent to Alice via the server. Since the message was encrypted using Alice's public key, we know that the only key that can decrypt it is the private key that belongs to Alice, and that only Alice actually has this key.

You've now accomplished your goal of getting the message from Bob to Alice without the server being able to read what's going on.

In fact, what I've shown here is a very simplistic diagram.

It's actually more complicated and requires a lot of software like this.

And that's really the key design challenge. All this complexity, how to implement all the software in a way that is invisible to the user.

At ProtonMail, I think we got pretty close to this.

Now let's see how it works in practice.

Here Bob and Alice reappear. They also want to communicate securely.

They just create an account with ProtonMail. This is very easy and takes some time. All key encryption and generation happens automatically in the background while Bob is creating his account.

Once your account is created, just click "Create" and you'll be able to compose emails just like you do now.

There he enters the information and after that he just clicks "submit". That way Bob sent an encrypted message without understanding encryption and doing anything different from how emails are written today.

What we've got here is really just the first step, but it shows that with the improvement of technology, privacy doesn't have to be hard, nor does it have to be destructive.

By changing your goal from maximizing ad revenue to protecting your data, you can actually make your data accessible.

Now, the question everyone is asking is privacy protection. This is a great goal, but can it really be achieved without the huge amount of money that comes from advertising?

And I think the answer is actually yes. Because today, people around the world have reached a stage where they really understand how important privacy is, and with it, anything is possible.

Earlier this year, when ProtonMail actually had too many users and ran out of resources, a community of users rallied to donate $500,000.

So this is just one example of what happens when we unite communities towards a common goal.

You can also take advantage of the world.

There are currently 250,000 people registered with ProtonMail. These people are coming from everywhere. This shows that privacy is not just an American or European issue, but a global issue that affects us all.

I really want to pay attention to it in the future.

So what do we have to do to fix this problem?

First and foremost, it needs to support alternative business models for the Internet that do not rely entirely on advertising for revenue and growth.

We really need to build a new internet where privacy and the ability to control data are paramount.

But more importantly, we need to build an Internet where privacy is not just an option, it is also the default.

We've completed our first steps with ProtonMail, but it's really just the first step in a very long journey.

The good news, the exciting news to share with you today is that we are not traveling alone.

The movement to protect people's privacy and freedom online is gaining tremendous momentum, and there are now dozens of projects around the world working together to improve privacy.

These projects secure file storage, online searches, online browsing, and much more, from chats to voice communications.

And while these projects aren't supported by billions of dollars in advertising dollars, they do have support from people around the world -- individuals like you and me.

This is very important. Because ultimately privacy depends on each one of us, and our online data is more than just a set of 1's and 0's, so we need to protect it now.

It's actually more than that.

It's our lives, our personal stories, our friends, our families, and in many ways our hopes and aspirations as well.

We need to spend time now really defending our right to share this only with people who want to share it. Because without this we cannot maintain a free society.

So now is the time for us to stand together and say, “Yes, we want to live in a world with online privacy, and we can work together to make this vision a reality.”

thank you.

(applause)

I want to start performing by saying that 90 percent of everything is crap.

(Laughter) It's called Sturgeon's Law, and it means that the majority of everything is always bad.

There is a giraffe here.

Throw a giraffe on your back and whoever catches it will help you with the next thing.

Teacher, you caught a giraffe.

I have a deck of cards in my hand.

Name the cards in your deck freely.

Audience: Ten of hearts.

Complete Guimaraes Province: 10 Hearts.

I said 10 of hearts, although it could be the name of any card in the deck.

Ninety percent of everything is crap, but it exists to prove Sturgeon was right.

(Laughter) (Applause) (Laughter) Sir, this is not your show.

(laughter) Giraffe, hold on a minute, okay?

Jesus.

(Laughter) Crazy people.

Well, really, why is most of everything bad?

And my answer is, "I think we stop thinking too soon."

Let me give you a clear little example. This is what people were doing around the turn of the century. Not this century, but the next century.

The idea was to take a piece of paper and fold it inside out using only your weak hand, in my case my left hand.

Something like this.

Your reaction shows your lack of interest.

(Laughter) But it's okay, I know why.

We quickly stop thinking.

But if you think about it a little more, it's kind of like a paperclip.

Using paper clips makes this a little more interesting.

Not only that, but it's even more fun if you make your hand into a fist instead of using your fingers.

Not only that, but I will impose a time limit of 1 second on myself. It is like this.

Now -- no, no, no.

Sturgeon may be right.

But he doesn't have to be right forever.

Things can always change.

Teacher, what was that card?

10 of hearts?

There is proof that things can always change. Ten of hearts.

(Applause.) Secrets are important.

And secrets are valuable.

And this is the biggest secret I have ever experienced.

It begins with a deck of playing cards placed on the table and an old man insisting that he never touches the cards until the end.

It doesn't matter who the man is. All that mattered was that word ringing in my head. "I won't touch the deck until the end."

Now, all this time he had a small notebook, which he would occasionally open and flip through to see something.

However, I was more focused on the deck and his earlier claim to "never touch the deck until the end," so I didn't pay much attention to this book.

Well, sir, you have a giraffe.

Now you can throw it in any direction and randomly find others.

Perfect. Sir, you will be playing my part in this story.

The old man turned to me and said, "You can choose a red card or a black card."

my answer is...

AUDIENCE 2: Black card.

HG: Certainly!

It was a black card.

He said, "It could be a club or a spade," and my answer was...

AUDIENCE 2: Spades.

HG: Certainly! it was a spade.

He said, "It could be a high spade, it could be a low spade."

And my answer is...

AUDIENCE 2: High spades.

HG: Certainly! It was a high spade.

It's a high spade, so it could be a 9, 10, jack, king, queen, or ace of spades.

And my answer is...

AUDIENCE 2: King.

HG: It's just the King of Spades.

Well, sir, let's be fair.

You chose black, you chose spades, you chose high spades, and you chose -- sorry?

AUDIENCE 2: King. HG: King of Spades.

Did you feel that I influenced you in any decision?

AUDIENCE 2: No, I felt your energy.

HG: But it was a free choice, right?

If you don't, you'll have to start all over again.

But was it really fair? Audience member 2: That's right.

HG: Well, the old man turned to me and asked another question, a number from 1 to 52.

And the first number that came to my mind was...

Audience 2: 17.

HG: Certainly! It was 17.

The old man simply said, "This is the end."

And I knew exactly what that meant.

I knew he was going to touch the deck.

Everything you see is what it seems.

He took the deck out of the box.

There is nothing inside the box.

He counted "1, 2, 3, 4, 5, 6, 7, 8, 9, 10".

I'm getting nervous.

(laughter) "11, 12, 13, 14, 15, 16, 17."

And on the 17th, instead of the King of Spades, something appeared in the middle of the deck, which I later found out was actually a secret.

The old man got up and left.

never saw him again.

But he left the notebook that was there from the beginning.

And when I picked it up, it was the best kept secret I've ever had.

We are defined by the secrets we keep and the secrets we share.

And this was how he shared the secret with me.

(Applause.) Oh my God! Now -- (laughter) I believe that amazing things happen all the time.

It's true.

And the reason we see them less often is because we're not in a position to look for those amazing things.

But what if we decide to look for those amazing, truly amazing little coincidences of life?

Now that you have a giraffe, throw it in any direction to randomly find the last one.

Doctor, can I ask you, do you have a US one-dollar bill?

AUDIENCE 3: I think so.

HG: Yes? Look, it's a coincidence!

(Laughter) Make sure you get it.

did you get it?

AUDIENCE 3: Yes. HG: Yes! Perfect.

Now, I want you to do exactly what I am about to do.

Here's a dollar bill to illustrate.

Take out a dollar bill and fold the Washington part inside like this.

You now have a large rectangle like this.

Now, fold the bill lengthwise like this into a rectangle, and then again -- really fold it, really crease it -- and when you've done that, fold the bill again into a little square like this, and let me know when you have it.

did you get it? Perfect.

I'm about to start working on it, but before I start, I want to make sure I'm doing this in a very serious situation.

First of all, you want to make sure you have markers and paper clips.

First, take a marker and sign the bill.

This is why. After this, I'm going to do a lot of things on stage, but I don't want it to look like someone came up on stage and exchanged bills while I was distracted by Herder.

So I want to make sure it's the exact same bill.

Not only that, put a paperclip around your bill.

So even if no one went on stage to switch bills, there wouldn't be enough time to open and close bills and see what you didn't want to see.

is that fair?

Now you can return the marker.

And so, very clearly, from the very beginning of this experience, we're going to put this in full view, and actually have a cameraman on stage to make sure everyone sees it.

Yes, perfect, as you can see.

is that your signature? yes? Perfect.

Here we also use decks and glasses.

And we will put ourselves in a position to look for surprising coincidences.

Are you sure, can you help me with this?

Now take out some cards and shuffle them.

So, can you please take some cards and shuffle them?

You can take out some cards and shuffle them.

You can shuffle your cards in various ways.

You can shuffle the cards like this.

This way you can shuffle your cards in even more crazy ways.

You can shuffle your cards the American way.

As a Portuguese, I don't think I'm qualified to tell you how to do it.

But it's important to remember to shuffle the cards and shuffle them to complete the deck.

Are you sure, sir?

Cut and complete.

Once you have it, put the card in the air.

And you too, cut and complete and go up in the air.

up in the air.

1, 2, 3, 4, 5 players cut and shuffle a deck of cards.

Now, obviously, I'm going to put the deck together.

And so on.

I'll try to find a coincidence in front of everyone.

I'm trying

Maybe there are some cards that might mean nothing.

But maybe it's because we're not paying enough attention.

Maybe, maybe, because they mean a lot.

Before we begin, sir, you gave me a one-dollar bill.

is that your signature?

AUDIENCE 3: Yes.

HG: I want you to see clearly that I am going to open your bill and reveal the little secret we made.

And the secret of this dollar bill is the serial number.

Ma'am, can you take the dollar bills?

There are letters in the serial number.

what is the first number after the letter?

Audience 4: 7 people.

HG: Seven.

Seven.

But it could just be a coincidence.

What is the second number?Audience 4:9 people.

So after 7 comes 9.

And after 9:00?

AUDIENCE 4: Two people.

HG: Those two. And after that?

AUDIENCE 4: Three.

HG: After the third time?

AUDIENCE 4: Three. HG: Three.

Audience 4: 7 people. HG: Seven.

Audience 4: Four people. HG: Four.

AUDIENCE 4: Two people. HG: Two, and?

Audience member 4: Q.

HG: Does Q feel like Queen?

(Applause.) Queen of the Club!

All cards in order, just for you.

And that's my show.

Thank you very much and have a nice night.

(applause)

We need to change the culture of prisons and jails, especially young inmates.

New York State is one of only two states in the United States.

Automatically arrest and trial 16-17 year olds as adults.

This culture of violence leaves young people in a hostile environment and prison officers tolerate almost anything.

There isn't much that these young people can do to really develop their talents and actually rehabilitate.

Until we raise the age of criminal responsibility to 18, we need to focus on changing the lives of young people.

I know firsthand

Before I turned 18, I spent about 400 days on Rikers Island, plus almost 300 days in solitary confinement. Let me just say this. I'm tired of screaming at the cell door all day long and screaming out the window all day long.

Since there is nothing to do while you are there, you start walking up and down the cell, you start talking to yourself, your thoughts start to run wild and eventually your thoughts become your own worst enemy.

In fact, prisons are meant to rehabilitate people, not to make them more angry, frustrated, or more hopeless.

Since these young people do not have a discharge plan in place, they rejoin society with almost nothing.

And there's not much they can do to prevent a relapse.

But it all starts with the Chief Executive.

Some see prison officers as good guys and inmates as bad guys, and vice versa, but not only a few.

You see, these chief executives are normal, ordinary people.

They are from the same area as the population they "serve".

they are just normal people.

They are not robots and nothing special.

They do pretty much everything the rest of society does.

A male C.O. wants to talk and flirt with a female C.O.

They play little high school games with each other.

They have political ties with each other.

And the female CO.Os gossip with each other.

So I've spent a lot of time with a lot of chief executives, and I want to talk specifically about one chief named Monroe.

One day he pulled me in between the A and B doors that separated the north and south sides of the house.

He took me there because I got into an argument with another young man in the housing unit and he felt I was violating my shift because there was a female police officer working on that floor.

So he punched me in the chest.

He blew the wind away from me.

I was not impulsive and did not react immediately. I knew this was their home.

I have no wins.

All he has to do is pull the pin and backup will come in no time.

So I looked into his eyes and I think he saw anger and frustration burning up. And he said to me, "Those eyes will get you into trouble because you look like you want to fight."

So he started removing his utility belt, took off his shirt and badge, and said, "I can fight."

So I asked him, "Are you going to keep it down?"

Now, this is a term often used on Rikers Island to mean to say nothing or report nothing to anyone.

He said, "Yes, I will hold you. Will you hold me?"

I didn't even reply.

I punched him in the face and we started fighting on the spot.

Towards the end of the fight he threw me against the wall and while we were scrambling he said to me: "are you OK?"

He said it as if he had done his best for me, but in my heart I knew that I had done my best for him, so I replied very cheekily: "Oh, I'm fine, are you okay?"

He said, "Yes, I'm fine, I'm fine."

When we let go, he shook my hand, said respect, gave me a cigarette, and sent me off.

Believe it or not, you'll encounter a CO. fighting you one-on-one on Riker's Island.

They feel how it is understood and they feel that I am going to meet you where you are.

Since this is a common way for customers to handle disputes, so can we.

I'll go away like a man, you'll go away like a man, and that's it.

Some Supreme Commanders feel they are in jail with you.

That's why they have that mentality and attitude and act according to that concept.

In some cases, we participate in it with our chief executives.

However, institutions need to give these officers proper training on how to properly deal with juveniles, as well as how to deal with mental health people.

These chief executives play a big role in the lives of these young people for x hours before the case is dealt with.

So why not mentor these young people while they are there?

Why not give them some insight into how to make a change so that they can take some positive action once they are reintegrated into society?

The second big thing that helps teens in prison is better programming.

When I was on Rikers Island, the hard part was solitary confinement.

Solitary confinement was originally designed to destroy a person mentally, physically and emotionally.

That's what it was designed for.

The US Attorney General recently released a report banning solitary confinement for teens in New York.

Reading was what kept me sane while I was in solitary confinement.

I tried to educate myself as best I could.

I read whatever I could get my hands on.

Apart from that, I wrote music and short stories.

One program that I think would benefit young people is an art therapy program for talented kids who love to draw, but what about young people who are interested in music?

What about music shows that actually teach you how to write and make music?

Just a thought.

When youth come to Rikers Island C74, the RNDC is the building that houses them.

It is called the "Gladiator School". Because there are young people who came from the streets thinking they were tough, surrounded by a bunch of young people from all five boroughs and everyone feels they are tough.

So now, young gentlemen, I feel like I have to stick my chest out and prove that I'm as tough as you or tougher than you, both you and me.

But let's be honest, that culture is very dangerous and harmful to young people.

We need to help institutions and teens understand that they don't have to live the old lifestyle they had on the streets and that they can actually make a difference.

Sadly, while I was in prison, I often heard people discussing when they would be released from prison and what crimes they would commit once they returned to the city.

The conversation went something like this: "Oh my brother got this and this and a third connection when I got out on the town" or "my guy here got this connection for a low price.

Let's exchange information", "I'll do it on a big scale when I go to town".

I listened to these conversations and was like, 'Oh, these guys are really talking about getting back on the streets and committing crimes in the future.

So I gave it a name. I named this "Planning to return to prison immediately." Because how long will it last?

Will I receive a retirement plan?

Nice little pension? 401(k)? 403(b)?

Do you have health insurance? dental?

(Laughter) But let me tell you this. In prison, and while in prison, I met some of the most intelligent, bright, talented people I've ever met.

I've seen people turn a bag of potato chips into a very beautiful picture frame.

I've seen people take free state soap and turn Michelangelo into a beautiful sculpture that looks like it was made by a kindergartener.

At 21, I was in a high security prison called Elmira Correctional Facility.

I came out of the weight shed after training and saw an elderly gentleman I knew standing in the middle of the garden looking up at the sky.

Mind you, this elderly gentleman is serving a life sentence of 33 years and 3 minutes and has already served 20 years.

So I walked over to him and said, "Oh, what's going on, are you okay?"

He looked at me and said, "Oh, young man, how are you?"

I said, "So why are you looking up at the sky?"

What's so fascinating about it? ”

He said, "Look up and tell me what you see."

"Clouds." (Laughter) He said, "Okay. What else do you see?"

At that time, an airplane passed by.

I said, "Okay, I saw the plane."

He said, "Exactly, so what's on that plane?" "people."

"Exactly. So where are those planes and those people going?"

"I don't know. Do you know?"

Please let me know if you'd like. So let's get some lottery numbers. ”

He said, "Young man, you are missing the big picture.

While we're stuck here, the plane with those people is heading somewhere else.

The big picture is this, the plane with those people is going somewhere, that's life passing by while we're stuck behind a wall. ”

Since that day, it triggered something in my mind and I knew I had to make a change.

As a child, I was always good and smart.

Some would say I'm a little too smart for myself.

I had a dream of becoming an architect or an archaeologist.

Currently, I work for the Fortune Society, a re-entry program, working as a case manager with people at high risk of re-offending.

So I provide them with the services they need after they are released from prison or prison so that they can reintegrate positively into society.

If I met my 15-year-old self today, I would sit down and talk to him, try to educate him, let him know, "Listen, this is me. I am you."

this is us. we are one

Anything you're going to do, I know what you're going to do before I do it, because I've already done it, and I advise him not to hang out with x, y, z people.

I tell him not to be in that place.

I would say to him, "Don't go to school, dude, because that's where you should be, that's where you're going to get you somewhere in life."

This is the message we should give to young men and young women.

We should not treat them as adults and throw them into a culture of violence from which it is almost impossible to escape.

thank you.

(applause)

Hello.

I'm a toy developer.

Nine years ago, I got a job at a toy company with the dream of creating a completely new toy.

When I started working there, I proposed many new ideas to my boss every day.

However, my boss always asked me, "Do you have data that can be sold?"

data, data, data.

So we analyzed the market data before thinking about the product.

But at that point, nothing new came to mind.

(Laughter.) My idea wasn't original.

I couldn't come up with new ideas, and I got tired of thinking about it.

It was hard to lose weight like this.

(laughs) It's true. (Applause.) I'm sure you've had similar experiences and felt the same way.

Your boss had a hard time. The data were difficult.

Now throw away the data.

My dream is to make new toys.

And now, instead of data, I'm thinking of new ideas using a game called Shiritori.

Today I would like to show you how.

What is Shiritori?

For example, consider apples, elephants, and trumpets.

A game where you say words in order starting with the last letter of the previous word.

It's the same in Japanese and English.

You can do your favorite Shiritori, such as "Cat, Colla, Live, Burashi". [Cat, Coke, Concert, Brush] A lot of random words will come out.

You combine those words with what you want to think and form an idea.

For example, in my case, I want to think about toys, so what would a cat toy be?

A cat that somersaults from a high place and lands?

How about a cola toy?

A toy gun that shoots cola and soaks your opponent?

(Laughter) Even if it's a silly idea. The key is to keep them flowing.

The more ideas you come up with, the more good ideas you will definitely come up with.

brushes for example. Can you turn your toothbrush into a toy?

Combine a toothbrush with a guitar and you have a toy that you can play with while you brush your teeth.

(Laughter) (Applause) Kids who don't like brushing their teeth might like it.

Why not turn your hat into a toy?

How about something like a roulette game? One hat at a time, and when someone puts it on, the terrifying alien bursts over the top screaming "Ah!"

Do you need it for parties?

Ideas that didn't come out while staring at the data will come out.

In fact, a toy that can pop as many soap bubbles as you like was born by combining the bubble wrap that packs this breakable item with a toy.

It was a big hit when it hit stores.

Data had nothing to do with its success.

It's just popping bubbles, but it's perfect for killing time, so please play with everyone today.

(Applause) But you keep coming up with useless ideas.

Come up with lots of trivial ideas.

If you come up with ideas based on data analysis and know what you are aiming for, you will work too hard to come up with new ideas.

Even if you know what you're aiming for, just close your eyes and let your ideas come to you as if you were throwing darts.

That way you'll be sure to hit the center.

At least one will.

That's what you should choose.

Then the idea will be both in demand and new.

That's how I come up with new ideas.

It doesn't have to be shiritori. There are many ways.

Just choose words at random.

You can flip through a dictionary and pick a word at random.

For example, you can search for two random letters and collect results, or you can go to a store and connect what you want to think of as a product name.

The point is to collect random words, not information for any category you think of.

By doing so, materials for associating ideas are collected, and connections are created that generate many ideas.

The biggest advantage of this method is that the images flow continuously.

As we are thinking word after word, we are left with the image of the previous word.

That image is automatically associated with future words.

Subconsciously, concerts are connected to brushes, roulette games to hats.

you won't even notice.

Of course, this method doesn't just apply to toys.

Collect ideas for books, apps, events, and many other projects.

I encourage everyone to try this method.

There is a future born from data.

But I look forward to using this silly game called Shiritori to create fun futures you could never have imagined.

thank you very much.

My name is Harry Baker. Harry Baker is my name.

If your name is Harry Baker, so is our name.

(laughs) It's a short introduction.

yes i'm harry

I study mathematics I write poetry

So I thought I'd start with a love poem about prime numbers.

(Laughter) It's called '59'.

I was going to call it "Primetime Loving".

That reaction is why I didn't.

(Laughs) Then "59".

59 wakes up on the wrong side of the bed.

I realize that all my hair is on one side of my head.

It takes less than a minute to find out that the way he slept was to blame.

He finds clothes and puts them on.

He involuntarily looks in the mirror and is subtly impressed by the rough yet casual look of his fiddle.

Then I looked out the window and saw the 60th birthday celebration across the street.

60 years old was beautiful.

Perfectly trimmed cuticles and wearing the right things.

Never rude or crude.

No room for improvement, punctual as always, more on the cue than the snooker ball, but I liked to play very cool.

59 wanted to tell her that she knew her favorite flower.

Every second, every minute, every hour he thought of her.

But he knew it wouldn't work, he couldn't get her.

Because even though she lived across the street, they were from different worlds.

59 admired 60's round figure, but 60 thought 59 was strange. (Laughter) One of his favorite movies was 101 Dalmatians.

She preferred the sequel.

He romanticized the idea that they were star-crossed lovers.

Because of each other, they were able to overcome adversity.

She maintained the strict views imposed by her mother, but the separation could not have been even.

At the time, he felt stupid and stupid for trying to love a girl controlled by a stupid mother, but he should have been comforted by that simple amount of money.

Subtracting 59 from 60 leaves 1.

Sure enough, after 2 months of walking around, 61 days later he found 61. He lost his keys and his parents were out.

So one day after school he went into the house When he noticed the slightly strange numbers on the door he wondered why he hadn't introduced himself before His jaw was in awe when she let him in.

61 was similar to 60, but a little more. (Laughter) She had prettier eyes, a friendly smile And, like him, a rough, casual style, And like him, a pile where everything was disorganized And, like him, her mother didn't mind if her friends stayed for a while.

Because she looked like him and he liked her too.

He thought she would like him too if she knew he looked like him. And this time it was different. I mean, this girl was evil, so he mustered up the courage to ask her for her number.

“I am 61,” she said. "I'm 59," he said, smiling.

I had a really good time today, so if it's okay with you tomorrow, can you come over to my house?

“Of course,” she said.

She loved talking to quirky people, so she agreed to this informal first date.

In the end, he was only ready a minute early, but she arrived a minute late, so it didn't matter.

And from that moment on, the chatter was constant, it didn't matter how they loved "X Factor", how they had two elements, being unique made them better, by the end of the night they knew they were meant to be together.

And then one day, she was talking about a stuck 60-year-old, and noticed that 59-year-olds looked a little weird.

He blushed and told her about his crush. "It was the best thing that ever happened, because it led us." The 61-year-old was smart, you see, not prone to jealousy, she looked him in the eye and said very sweetly, "You're 59, I'm 61, and together we're double 60."

(Laughter) At this point, 59 had tears in his eyes. So happy to have this unique girl in his life.

He told her that the very definition of being prime was having his mind split between just him and her, and she was the person he wanted to give his heart to, and now the movie turns out to be half-truth.

They were the archetypes when it came to true love, because it wasn't true love and that love was just a sample.

cheers.

(Applause) That was the first poem I wrote for a prime number poetry night -- (Laughter) -- which resulted in a prime number poetry contest.

And I became the winner of a poetry competition on the theme of prime numbers, or, as I like to call it, Prime Minister. (Laughter) And this is how I found out about this thing called Poetry Slam. For those of you who don't know what a poetry slam is, it's a format that was devised in America 30 years ago as a way to trick people into going to a poetry event by adding a provocative word like "slam" at the end.

(Laughter) And then each performer is given three minutes of playing time, a random audience member holds up the scorecards, and finally a numerical score. What this means is breaking down barriers between the performer and the audience and facilitating a kind of connection with the listener.

And that means you can win.

And if you win a poetry slam, you can call yourself a slam champion and pretend to be a wrestler, and if you lose a poetry slam, you can say, "Oh, what? Poetry is a subjective art form. You can't put a number on that."

(Laughter) But I loved it, I went to the competition, I became the All England champion, and I got invited to the World Cup of Poetry in Paris, and it was unbelievable.

People from all over the world spoke their native language and were judged by five French strangers.

(Laughter) And somehow I won. It was great. Since then I have been able to travel the world. But it also means that this next work is technically the best poem in the world.

(laughs) So…

(Applause) According to five French strangers.

Hence "Paper People".

i like people

I want a paper person

They would be purple paper people. Maybe a pop-up purple paper person.

A pop-up purple paper person.

"How do you support the pop-up purple man?"

I hear you cry Well I...

You'll probably prop up the right pop-up purple paper people with the right pop-up purple paperclip, but as a substitute you'll pre-prepare the right glue and a pack of cheeky blue tack in case the paper slips.

Because you can build a pop-up metropolis.

But I don't want to get involved in the politics of paper people.

Paper politicians with paper-thin policies and broken promises without a proper apology.

There will also be a small paper me. And give you a little piece of paper.

And you could watch paper TV, but it would all be pay-per-view.

(Laughter) I've seen poppy paper wrappers rapping about paper packages and paper delivery guys getting stuck in jams of A4 paper.

(laughs) Paper.

There will be a paper Princess Kate, but we will all be staring at a paper Pippa and living in fear of the killer Jack the Paper Ripper as paper propaganda spreads prejudice and prints photogenic terrorist pictures.

A little paper me. And give you a little piece of paper.

And in the sudden mass, people's problems also arise.

There will be a arrogant paper parliament that ignores paper, ignoring people's protests against all paper cuts, and peaceful paper protests will be blown to pieces by preemptive police confetti cannons.

And surely paper money will still exist, so paper greed will still exist, and paper piggy bankers are pocketing more than they need and buying potpourri to pepper their paper fortunes, and others are living in poverty and not being properly acknowledged.

A true poverty economy where so many people are truly poor, yet funds flow to great wars while their needs are ignored.

The Origami Legion has rolled out a plan for paper planes, and we remain trapped in our own paper chains, which is even more disappointing to see that never change. What changes is that those in power choose who is in charge, and they give names but forget that this is the name of the person. Because in the end it all comes down to people.

i like people

Because only humans can motivate you when things are dire, and on paper it's hard to understand how we're all coping.

But there is still hope at the bottom of Pandora's box and I still have hope because I believe in people.

They are like my grandparents.

Those who have taken the time to pray for me every morning since I was born.

This is 7892 days in a row since someone confirmed I was fine, which is amazing.

People like my aunt are prisoners and theater people.

A person who can forgive from the heart.

People love persecuted Palestinians.

People who go all out to make your life better and expect nothing in return.

You know, people can be powerful.

We don't have to give in to the system just because those in power tend to pretend to be victims.

The paper population is no exception.

There's a little paper me And give you a little piece of paper.

And although the population suddenly pops up, people's problems also arise, but even if the whole world were to collapse, we would still be able to survive.

because we are human.

thank you.

(Thank you for applause. I have time, so just one more.

Poetry for me was the ultimate vehicle for ideas without borders.

When I first started working, I was inspired by people with great stories. As an 18-year-old with a happy life, I thought that was too normal, but I thought I could create these worlds where I could talk about my experiences, my dreams, my beliefs.

So I'm really happy to be here in front of you all today.

Thank you for being here.

If you weren't here, yesterday's soundcheck would have been pretty much the same.

(laughs) And this is more fun.

So this last work is called "Sunshine Kid".

Thank you for your attention.

The Sun Old Man was proud of his sun, and seeing his little son running brightened his day, not because of what he had done or the problems he had overcome, but because his disposition remained radiant nonetheless.

It wasn't always like this.

There were times when he tried to hide his brightness, you know, every star has hard times, they need a brighter light to inspire them in the dark.

Back when he was born in the nebula, I know he was never thought of as a normal person, I say touches like Midas are wrong because he had talent, but everything he came near seemed to turn a little bronze, yes, this sun was loved by some more than others, and that was the case with Joseph and his dreamcoat and his brothers. made enemies to those who were superior to him, such as the people of

Well the shadow people didn't like the sunshine kid because he revealed the dark things the shadow people did and when he shined he showed where the shadow people hid so the shadow people had an evil plan to eliminate him, firstly they made fun of his sunspots and shot his dreams out of the sky and told him that their words were gunshots and that he wasn't very cool. Designed to be a reminder, he wasn't familiar with the popular kids at school.

They said his head was in space and they would bring him down to earth, essentially he was born out of nothing and that's what he's worth, he can never go to college to learn, all he's ever shown is first-degree burns .

For the Son of the Sun was bright and warm in nature, and in his heart he was deeply wounded by the words and curses of the shadow people that left holes and cavities in his soul, and his heart hardened and the sparks darkened, every time they called his name his fire cooled, he thought they might like him if they kept the light dim, but they were busy saying that the lightning bolt had a terrible purpose, he perfectly understood what they said. Unable to comprehend, so affected by their words that eclipsed his light, he fell into an isolated star state like Texas and felt beaten in the pit of his stomach.

But then Little Miss Sunshine came along and sang her favorite song about how we're going to be strong and there's no wrong in belonging, just stay true to yourself because we're all stars at heart.

Little Miss Sunshine was so charming, she was such a forgetful girl, but he never forgot her, the moment he saw her, her image was burned into his retinas, she was not of this world, and she embraced him, something about this girl meant that whenever he was next to her, he knew she was there, things weren't as dark as they seemed, and he dared to dream, shadows were nowhere to be seen. There was none; shadows were nowhere to be seen. When she was there he had a wide smile, his eyes shone undeniably, when she smiled, her rays erased the razor-tips of hateful words, they dubbed each other "cool star," "joyful sun," and gradually the shadow's damage faded away, she was alone in Septillion, she was clever, could turn the most cold-blooded reptilian into vermilion, from Chilean. Loved by billions, even Brazilians, and taught the Sunshine Kid the meaning of resilience.

she said: "If the darkness of the world can't put out a single candle, how can they handle your light?"

Only you can choose to make it dark, and the sky has its limits, so burn it and silence the critics. ' And if the eye is the window to the soul, she pulled back the curtain and let the sun shine into the wound.

In a universe of adversity, these stars stuck together, and when day turned into night, the memories would last forever, whether the weather forecasters said it would be okay, because behind the clouds a child can still shine.

Yes, the Sunshine Kid had a bright, warm personality, and he was burning fiercely inside, fueled by a fire inspired across the galaxy by the girl who showed him faith.

thank you very much.

(applause)

i am a historian.

Steve told us about the future of small tech. Here are some of the pasts of big tech.

This was to build a 4,000-ton nuclear-bomb-propelled spacecraft that would go to Saturn and Jupiter.

This happened in my childhood from 1957 to 1965.

categorized quite deeply.

Here are some that have not only been declassified, but are now reclassified.

(laughter) If all goes well, I'll be back next year to show you a lot more. And if all goes wrong, I'll end up in jail like Wenho Lee.

(Laughter) So this ship was basically the size of a Marriott hotel, just a little bit taller and a little bit bigger.

And one of the first people to work on it was my dad in the middle, Freeman.

It's me and my sister, Esther, who is a frequent TEDster.

I never liked nuclear bomb-propelled spacecraft.

I mean, I thought it was a great idea, but I started building kayaks.

So we had a few kayaks.

Please know that I am not Dr. Strangelove.

But all the time I was on these strange kayak voyages in the strange and beautiful parts of this planet, I was always thinking in the back of my mind about the Orion Project and how my father and his friends were going to build these big ships.

They were actually going - Ted Taylor, who led the project, was going to take the kids.

Father refused to take the children. That was one of the reasons we fell out for several years.

(Laughter) This project started in '57 at General Atomics on the La Jolla coast.

Look at the central building in the middle of the photo.

It's a library 130 feet in diameter.

It's exactly the size of the bottom of a spaceship.

So put that library in the bottom of that ship - that's how big it gets.

You'll need 2000 or 3000 bombs.

Many of the people in Los Alamos who worked on the hydrogen bomb worked on it.

This was the first project funded by ARPA.

This is the contract that ARPA provided the first million dollars to get this thing started.

"The spaceship project has officially begun. Jobs await. Dyson."

It was July 1958.

Two days later, as we heard yesterday, the Space Travelers' Manifesto was released, explaining why we need to go to space. "...a trip to the moons of the outer planets.

These are the stats about good places to go and stop by.

Depending on the size of the ship, the mass of the ship can reach 8 million tons.

So it was the outer extreme.

This is version 2, 2,000 bombs.

These are 5 kiloton yield bombs, about the size of a small Volkswagen. It takes 800 meters to get into orbit.

Here we show a 10,000-ton ship carrying 1,300 tons to and from Saturn. This is effectively a 5 year journey.

Possible departure dates: October 1960 to February 1967.

These are the orbits towards Mars.

Everything was done by hand using a slide rule.

A small Orion ship, and what it takes to do what Orion does with chemicals. There are ships the size of the Empire State Building.

NASA showed no interest. They tried to cancel the project.

The Air Force backed it, so it was all secret.

That's why it looks that way when you get it declassified.

A version of a military weapon that carries a hydrogen bomb capable of destroying half the planet.

This is really a secret. How to create a directed energy blast.

So you're directing the energy of a nuclear explosion toward the ship, not just like a stick of dynamite.

And this is still a very active subject.

It's a pretty dangerous thing, but I think it's better to make it public than to think about keeping it a secret.

This is what happened in 600 microseconds.

The Air Force started making smaller models and actually started doing this.

The people of La Jolla said, "We have to start now."

They built a high-explosive projectile model.

These are stills from film footage that has been stored in the basement of my home for the past 40 years, preserved by someone who should have destroyed it but didn't.

So these are 3 lbs of charge for the C4. That's about ten times the amount the man was wearing in his shoes.

(Laughter) This is Ed Day -- I mean, each of these coffee cans has three pounds of C4.

They are building a system that ejects these every quarter second.

It's my father in a sports coat with a briefcase.

So they enjoyed this a lot.

However, no children were allowed. I could tell him that he was going to build a spaceship and go to Saturn, but he couldn't say much more about it.

So I've been wanting to find this out for a long time and have spent the last four years tracking down these old people.

These are stills from the video.

Yesterday, Jeff Bezos kindly said he would put this video up on Amazon's site - a small clip of it.

(Applause.) So thank him.

They took this engineering pretty seriously.

For us, that mass is a very big technology that we can never go back to.

If you've seen 1959, here's what it looks like inside the cabin. That's the acceleration profile.

(Laughter) And the yield of the pulse system: we're looking at a yield of 20 kilotons for 10 million newtons of effective thrust.

Now, I have a little problem here. The radiation dose at the crew station is 700 rads per shot.

(Laughter) Fission rate in development: They hoped to get a clean bomb. they didn't.

Bleeding eyes: This is what happens to Miami people who look up.

(Laughter) Personnel room noise: It's not that bad. It's very low frequency, basically like these subwoofers.

And now we can assess the ground hazard in the event of an explosion at the pad.

At the last minute in 1964, NASA stepped in and said, "Okay, I'll help you feasibility study a smaller version of the Saturn V that can be split and pieced together."

This is what NASA did and got the 8-man version going to Mars.

They could live there, and they liked it because it was like living in a submarine.

It switches, so when you put it in artificial gravity mode, it's upside down.

The scientists were still going to continue their research. They will take 7 astronauts and 7 scientists with them.

This is the 20 person version to go to Jupiter: bunks, storm cellar, exercise room.

You know, it's going to be a wonderful long journey.

Air Force Version: Here is the military version.

This is the unclassified kind, people just managed to sneak it home and then gave it to me on their deathbed, I mean.

These are basically PowerPoint presentations given to the Air Force 40 years ago.

Look at those little guys outside the car.

Part of NASA was interested in it, but NASA headquarters canceled the project.

So, in the end, we see that this object went down some sort of design path until 1965, but then all those paths stopped.

Result: None.

This project is finished.

That's it.

Last but not least, we heard yesterday that one of the ten bad things that could happen to us is an asteroid bearing our name.

One of the worst things that can happen to NASA is that nine months from now the asteroid will show up with our name on it and everyone will say, "So what are we going to do?"

And Orion is actually one of, if not the only, off-the-shelf technology that can do something.

(Laughter.) So, I'd like to give you some good news and some bad news.

The good news is that NASA has a small, top-secret Contingency Planning Department that is looking into this and is trying to save information about Orion in case something unfortunate like this happens.

It might be a good idea to keep some small plutonium bombs.

That's good news.

The bad news is that when I contacted these people to get the document, they were furious because I had everything they didn't have, and NASA bought 1,759 pages of this document from me.

That is our current state. Not very good.

(laughter) (applause)

I have a confession to make.

I am a professor of business administration and my goal is to help people achieve leadership.

But recently, I've realized that what many of us think of as good leadership doesn't work when it comes to leading innovation.

I am an ethnologist.

I use anthropological methods to understand questions of interest.

There, along with three co-conspirators, I spent nearly a decade observing outstanding innovation leaders up close.

We surveyed 16 men and women living in 7 countries around the world and working in 12 different industries.

In total, we spent hundreds of hours in the field observing the behavior of these leaders.

We analyzed page after page of field notes looking for patterns in leader behavior.

Conclusion?

If we want to build an organization that can innovate again and again, we need to abandon traditional notions of leadership.

Leading innovation is not about creating a vision and pushing others to execute it.

But what does innovation mean?

Innovation is anything new and useful.

It can be a product or service.

It can be a process or a way of organizing.

It can be incremental, or it can be groundbreaking.

It has a fairly comprehensive definition.

How many people know this guy?

please raise your hand

Raise your hand if you know who this is.

What about those familiar faces?

(Laughter) Looking at your hands, many of you have seen the Pixar movies, but very few of you have heard of Ed Catmull, Pixar's founder and CEO. Pixar is one of the companies I have had the opportunity to study.

I first visited Pixar in 2005 when they were making Ratatouille, a provocative movie about a mouse becoming a master chef.

Computer-generated movies are really mainstream today, but it took Ed and his colleagues nearly 20 years to create their first feature-length CG. movie.

Over the next 20 years, he made 14 films.

I was at Pixar recently and I want to tell you that number 15 is a definite winner.

But when most of us think of innovation, we think of Einstein exclaiming, "Ah!" for a moment.

But we all know it's a myth.

Innovation is not about a single genius, it is about a collective genius.

Think for a moment about what it takes to make a Pixar movie. No single genius or flash of inspiration makes these films.

On the contrary, it takes about 250 people and 4-5 years to make one of these films.

To understand the process, one of us in the studio drew a version of this painting.

He reluctantly did so because it suggested that the process was a neat series of steps carried out by separate groups.

Even with this many arrows, he thought, they couldn't really convey how repetitive, interconnected, and frankly confusing their process was.

The story evolves through filmmaking at Pixar.

So let's think about it.

Some shots pass quickly.

Not everything goes in order.

It depends on how daunting the challenges they come up with when working on a particular scene.

So if you think about the scene where the boy gives chocolate to the bird in "Up," that ten seconds took almost six months for one animator to complete.

Another feature of Pixar movies is that no part of a movie is considered finished until the entire movie is finished.

Halfway through one piece, an animator drew a character with arched eyebrows that suggested a mischievous side.

The director saw the picture and thought it was great.

It was beautiful, but he said, "It should be lost. It doesn't fit the character."

Two weeks later the director came back and said, 'Let's put that few seconds of film in.'

The animator was allowed to share what we called a piece of his genius, so he could help the director rediscover the character in subtle but significant ways that really improve the story.

What we do know is that at the heart of innovation lies contradiction.

We need to unleash the talents and passions of many people and turn them into real, useful work.

Innovation is a journey.

It is a form of collaborative problem solving, usually between people with different expertise and different perspectives.

Innovation is rarely produced in earnest.

As many of you know, these are usually the result of trial and error.

There are many false starts, failures and mistakes.

Innovative work can be very exhilarating, but it can also be very intimidating.

So when we think about why Pixar could do something like this, we have to ask ourselves. What is going on here?

Indeed, history, and certainly Hollywood, is full of failed star-studded teams.

Most of these failures are attributed to having too many stars in the kitchen, or too many cooks, if you will.

So what makes Pixar and its cooks so successful over and over again?

When we studied Islamic banks in Dubai, luxury brands in South Korea, and social enterprises in Africa, we found that innovative organizations are communities with three competencies: creative attrition, creative agility and creative solution.

Creative wear is the ability to create a market for ideas through discussion and discourse.

In innovative organizations, differences are amplified, not minimized.

Creative wear isn't brainstorming where people reserve judgment.

No, they know how to have very heated but constructive discussions to create a portfolio of alternatives.

Employees of innovative organizations learn how to inquire and how to actively listen, but what about?

You will also learn how to advocate for your point of view.

They understand that innovation rarely happens without both diversity and conflict.

Creative agility is the ability to test and refine a portfolio of ideas through rapid pursuit, reflection, and adjustment.

This is discovery-driven learning where you act rather than plan your way into the future.

Design thinking is an interesting combination of scientific method and artistic process.

It's about running a series of experiments, not a series of pilots.

Experiments are usually for learning purposes.

Even with negative results, you're still really learning something to know.

Pilots often value what is right.

When they go wrong, someone or something is to blame.

The final feature is creative resolution.

This is about making decisions in a way that even conflicting ideas can actually be combined and reconfigured in new combinations to yield new and useful solutions.

If you look at innovative organizations, they never get along.

they don't compromise.

We do not allow one group or one individual to dominate, even if it is the boss, even if it is the professional.

Instead, they have developed a much more patient and more inclusive decision-making process that allows them to produce both solutions rather than just one or the other.

With these three features, you'll see what Pixar can do.

Let me give you another example. An example of this is Google's Infrastructure Group.

Google's Infrastructure group is the group that needs to keep your website up and running 24/7.

So when Google was rolling out Gmail and YouTube, they knew their data storage systems weren't the right fit.

The head of the engineering and infrastructure groups at the time was a man named Bill Colan.

Bill and his leadership team, which he called the Brain Trust, had to figure out how to handle the situation.

They thought about it for a while.

Instead of creating a group to tackle this challenge, we decided to allow groups to spontaneously emerge around different alternatives.

The two groups merged.

One became known as Big Table and the other as Build It From Scratch.

Big Table proposed building on the current system.

Build It From Scratch suggested it was time for a whole new system.

Separately, these two teams were allowed to work full-time on specific approaches.

During the engineering review, Bill described his role as "injecting integrity into the process by driving discussion."

Early on, teams were encouraged to create prototypes so they could "face reality and discover for themselves the strengths and weaknesses of a particular approach."

When Build It From Scratch shared its prototype with a group that had to beep in the middle of the night if something went wrong with their website, they heard loud and clear about their particular design limitations.

As the need for a solution became more urgent and data or evidence began to arrive, it became clear that the Big Table solution was the right fit for the moment.

So they chose it.

But in order not to lose the learnings of the Build it From Scratch team, Bill asked two members of that team to join the emerging new team to work on the next-generation system.

The entire process took nearly two years, and I've heard it all happened at breakneck speed.

Early in the process, one of our engineers went to Bill and said, "We're all too busy, and this inefficient system of running parallel experiments is taking too long."

But as the process progressed, he began to see the wisdom of enabling talented people to fulfill their passions.

"If they had forced us all to be on the same team, we might have been more focused on proving who was right and winning, rather than learning and discovering what was the best answer for Google," he admitted.

How can Pixar and Google innovate again and again?

Because they have the necessary skills to do so.

They know how to solve problems collaboratively, conduct discovery-driven learning, and make integrated decisions.

Some of you may be sitting there right now thinking:

So why do they know how to do those things at Pixar, and why do they know how to do those things at Google?"

When many of the people who worked under Bill told us that Bill was one of Silicon Valley's greatest leaders, we totally agreed. The man is a genius.

Leadership is the key.

But it's a different kind of leadership, not the kind that many of us think of when we think of good leadership.

One of the leaders I met early on said, "Linda, I don't read books on leadership.

All they do is make me feel bad. (laughs) “In the first chapter, they ask me to create a vision.

But if you're trying to do something really new, I don't have the answer.

I don't know which direction we are going, or even how to find a way to get there. ”

Indeed, there are times when visionary leadership is just what is needed.

But if we want to build an organization that can innovate again and again, we need to rebuild our understanding of what leadership is.

Leading innovation means creating spaces where people are happy to do the hard work of innovative problem solving.

At this point, some of you may be wondering, "What exactly is that leadership?"

At Pixar, we understand that innovation requires a village.

Leaders build a sense of community and focus on building these three competencies.

How do they define leadership?

They say leadership is about creating a world that people want to belong to.

What kind of world do people want to belong to at Pixar?

A world that lives on the edge.

What do they focus their time on?

It's not about creating a vision.

Instead, they spend their time thinking, 'How do we design a studio with the feel of a public square so people can interact?'

Introduce a policy that allows anyone, regardless of level or role, to make notes to the director about how they felt about a particular movie.

How do we make sure that every disruptor, every minority voice within this organization speaks up and is heard?

And finally, give credit in a very generous way. ”

I don't know if you've seen the credits of any Pixar movie, but it lists babies born during production.

(Laughter) What did Bill think about his role?

“I lead a volunteer organization,” Bill said.

Talented people don't want to follow me anywhere.

They want to create the future with me.

My job is to nurture the bottom-up and keep it out of the way. ”

How did he view his role?

“I am a role model, a human glue, a connecter and a focuser.

I am by no means a point of view dictator. ”

Any advice on how to fulfill the role?

Hire someone to argue with you.

And what about?

Sometimes it's best to intentionally vague and vague.

You may be wondering, "What are these people thinking?"

They think, "I'm not a visionary, I'm a social architect.

I create spaces where people are happy to share and combine their talents and passions. ”

If you're worried that you're not working at Pixar or Google right now, I'd say there's still hope.

We've studied a lot of organizations, but they weren't really thought of as the ones where a lot of innovation happens.

We surveyed a pharmaceutical company general counsel who had to find a way to innovate by working with 19 outside competitors.

We surveyed the marketing heads of German automakers, and they basically believed that it was the design engineers, not the marketers, who were allowed to be innovative.

We also learned about Vineet Nayar at HCL Technologies, an outsourcing company in India.

When we met Vineet, his company was, in his words, on the verge of becoming worthless.

We have watched him transform the company into a global IT dynamo. innovation.

At HCL Technologies, like many companies, leaders knew their role was to set the direction and ensure no one strayed from it.

What he did was tell them it was time to rethink what they were doing.

Because what was happening was that everyone was looking up and we didn't see the bottom-up innovation that we saw at Pixar and Google.

So they started working on it.

They stopped giving answers and stopped trying to offer solutions.

Instead, they began to see people at the bottom of the pyramid, young talent, those closest to their customers as sources of innovation.

They started transitioning their organizational growth to that level.

In Vineet's words, this was about inverting the pyramid and unleashing the power of the many by loosening the shackles of the few, improving the quality and speed of innovation happening every day.

Indeed, Vineeth and all the other leaders we studied were actually visionaries.

Surely they understood that it was not their role.

So I don't think it's a coincidence that many of you haven't heard of Ed.

Because Ed, like Vineet, understands that our role as leaders is to set the stage, not to perform on it.

If we want to invent a better future, and I think that's why many of us are here, we need to rethink our mandate.

Our mission is to create spaces where pieces of everyone's genius can be unlocked, harnessed, and transformed into works of collective genius.

thank you.

(applause)

I can't forget them.

Their names are Aslan, Arik, Andrei, Fernanda, Fred, Galina, Gunhild, Hans, Ingeborg, Matti, Natalia, Nancy, Cheryl, Usman, Zarema, and the list goes on.

For many, their existence and humanity have been reduced to statistics and coldly documented as "security incidents."

For me, they were colleagues in a community of humanitarian aid workers who tried to bring some solace to the war victims in Chechnya in the 90s.

They were nurses, logistics and shelter professionals, paralegals and interpreters.

And for this service they were murdered, their families torn apart, and their stories largely forgotten.

No one has ever been sentenced for these crimes.

I can't forget them.

They somehow live on in me and their memories give me meaning every day.

But they also haunt the dark trails of my mind.

As humanitarian aid workers, they chose to stand by the victims and offer some help, comfort and protection, but not when they themselves needed it.

A recent newspaper headline about the wars in Iraq and Syria shows aid workers being kidnapped and hostages being executed, but who were they?

why were they there?

What motivated them?

Why have we become so indifferent to these crimes?

This is why I am here with you today.

We need to find better ways to remember them.

They should also describe the main values ​​to which they have devoted their lives.

We also need to demand justice.

When I was sent to the North Caucasus in 1996 by the United Nations High Commissioner for Refugees, I knew some of the risks.

Five of his colleagues were killed, three seriously injured, and seven had already been taken hostage.

So we were careful.

We had all sorts of security measures in place: armored vehicles, decoy vehicles, changes in movement patterns, changes in housing.

But on a cold winter night in January 1998, it was my turn.

When I entered Vladikavkaz's apartment with security guards, I was surrounded by armed men.

They grabbed the guard, put him on the floor, beat him, tied him up and dragged him away right in front of me.

I was handcuffed, blindfolded, and kneeled with a gun silencer pressed to my neck.

When it happens to you, there is no time to think or pray.

My brain kicked in automatically and quickly rewound the life I had just left.

It took me a long time to realize that the masked men there weren't there to kill me, but someone somewhere ordered my kidnapping.

And from that day the process of dehumanization began.

I was just a commodity.

I don't usually talk about this, but I would like to talk a little bit about my 317 days of confinement.

I was locked in a dark basement for 23 hours and 45 minutes every day. Then came the guards (usually two).

They brought a large loaf of bread, a bowl of soup, and a candle.

That candle kept burning for fifteen minutes, giving me precious light for fifteen minutes, then they took it away and I was back in the dark.

I was chained to my bed by a metal cable.

Only four small steps could be performed.

I always dreamed of a fifth.

No TV, no radio, no newspapers, no one to talk to.

We had no towels, no soap, no toilet paper, just two open metal buckets, one for water and one for excrement.

Can you imagine mock executions becoming entertainment for prison guards when they are sadistic or just bored or drunk?

We are breaking my nerves very slowly.

Loneliness and darkness are particularly difficult to explain.

How do you explain nothing?

There are no words for the depth of loneliness I have reached with such a thin line between sanity and madness.

Sometimes we would play an imaginary game of checkers in the dark.

I started with black, played with white, then went back to black to try and trick the other side.

I don't play checkers anymore.

I was tormented by the thoughts of my family and my fellow security guard, Edik.

I didn't know what happened to him.

I tried not to think about anything and do all kinds of exercises on the spot to fill the time.

I tried praying and playing all sorts of memorization games.

But darkness also creates images and thoughts that are not normal.

Part of your brain wants you to resist, scream, or cry, while another part of your brain tells you to shut up and just let it go.

It's a constant discussion within the company. There is no one to arbitrate.

One time a security guard came up to me very aggressively and said, "I'm going to kneel down and beg for food today."

I was in a bad mood, so I insulted him.

I insulted his mother, I insulted his ancestors.

The result was moderate: he dumped the food in my waste.

The next day he returned with the same request.

He got the same answer, which gave the same result.

After 4 days, my body was full of pain.

I never knew hunger could hurt so much when food was scarce.

So when the guards came down, I fell to my knees.

I begged for food.

Submitting was the only way to get to the next candle for me.

After being kidnapped, I was transported from North Ossetia to Chechnya, slowly moved in the trunks of various cars for three days, and upon arrival was interrogated for 11 days by a man named Ruslan.

The routine was always the same, a little lighter, 45 minutes.

He came down to the basement, asked security to tie me to a chair, and played loud music.

And he yelled out a question.

he will scream he will hit me

I will omit the details.

There were many questions I didn't understand, and some questions I didn't want to understand.

The length of the interrogation was the length of the tape, 15 songs, 45 minutes.

I always look forward to the last song.

One day, one night, in that basement, I don't know what it was, but above my head I heard a child cry. It was a boy, probably two or three years old.

Footsteps, confusion, people running.

So when Ruslan came the next day, before he asked me his first question, I asked him, "How is your son today? Are you feeling better?"

Ruslan was surprised.

He was furious that security guards may have leaked details about his private life.

I kept talking about an NGO supplying a local clinic with medicines that could help my son recover.

And we talked about education, about family.

He told me about his children.

I told him about my daughters.

And he talked about guns and cars and women and I got to talk about guns and cars and women.

And we talked until the last song on the tape.

Ruslan was the most brutal man I have ever met.

he didn't touch me anymore.

He asked no other questions.

I was no longer just a commodity.

Two days later I was transferred to another location.

So a guard came very close to me - which was quite unusual - and said in a very gentle voice: "I would like to thank your organization for the support that my family had provided during our evacuation near Dagestan."

What should I answer?

It hurt so much. It felt like a knife had been stabbed in my stomach.

It took weeks of internal thought as we tried to reconcile the family and the legitimate reasons why he had to support the man who had become a warrior of destiny.

He was young and shy.

I have never seen his face.

Perhaps he meant it in a good way.

But in those 15 seconds, he made us question what we had done, all the sacrifices we made.

It also made me think about how they view us.

Until then I thought they knew why we were there and what we were doing.

You cannot assume this.

It's not so easy to explain why we do this, even to our closest relatives.

We are not perfect, we are not superior, we are not the world's firefighters, we are not superheroes, we will not stop wars, and we know that the humanitarian response is not a substitute for political solutions.

Yet we do this because one life matters.

Sometimes for individuals, families and small groups of individuals it's the only difference and that's what matters.

When tsunamis, earthquakes and typhoons strike, rescue teams from all over the world flock to search for survivors for weeks.

why? No one doubts this.

All lives matter or all lives should matter.

This is also the case when assisting refugees, internally displaced persons due to conflict, and stateless persons. I know many people who feel helpless in the face of overwhelming suffering and stop there.

It's a shame because there are so many ways to help people.

We don't stop there.

We try to do whatever we can to provide some support, protection and comfort.

we have to.

You can't do anything else.

It makes us feel, I don't know, simply human.

That's a picture of the day I was released.

A few months after my release, I met with the then Prime Minister of France.

The second thing he said to me was, "It was totally irresponsible to go to the North Caucasus.

You don't know how much trouble you've caused us. ”

It was a short meeting.

(Laughter.) I think we have a responsibility to help people who are in danger.

In that war, no one seriously tried to stop it, and there are many wars going on today, but bringing help and a little protection to those in need was not just a humanitarian act, it was a real change for people.

Why couldn't he understand this?

We have a responsibility to try.

You've probably heard of the concept of "responsibility to protect".

Results may depend on various parameters.

You may even fail, but there are worse things than failure. It's about not even trying when you can.

If you meet someone like this and apply for this kind of job, your life will be filled with joy and sorrow, because there are so many people we cannot help, protect, and save.

I call them my ghosts, but by witnessing their suffering up close, you owe a little of it to yourself.

Many young humanitarian workers find their first experience bitter.

They are thrown into witness situations, but powerless to effect change.

They have to learn to accept it and gradually transform it into positive energy.

it's difficult.

Many people don't make it, but for those who do, there is no other job like it.

You can see the difference everyday.

Humanitarian workers know they are at risk in conflict and post-conflict environments, but our lives and jobs are increasingly endangered and our lives less sacred.

Did you know that the number of attacks against humanitarian aid workers has tripled since 2000?

2013 set a new record. 155 of his colleagues were killed, 171 seriously injured and 134 kidnapped.

So many broken lives.

Until the civil war in Somalia began in the late 80s, humanitarian aid workers were sometimes victims of so-called collateral damage, but by and large we were not the target of such attacks.

This has changed.

look at this image.

Baghdad, August 2003: 24 colleagues killed.

Gone are the days when the UN blue flag and the Red Cross automatically protected us.

Over the last 20 years, criminal organizations and some political organizations have merged with each other to create this kind of hybrid that we have no way of contacting.

Humanitarian principles are tested, questioned, and often ignored, but perhaps more importantly, we have abandoned the pursuit of justice.

Attacks against humanitarian aid workers appear to have had no effect.

After my release, I was told not to seek any form of justice.

It will do you no good, I was told.

Moreover, you endanger the lives of other colleagues.

It took many years to see the verdict of the three people involved in my kidnapping, but this was an exception.

There was no justice for humanitarian workers killed or kidnapped in Chechnya between 1995 and 1999, and it is the same around the world.

This is unacceptable.

This is inexcusable.

Attacks on humanitarian aid workers are war crimes under international law.

Those crimes should not go unpunished.

We must end this cycle of impunity.

We must consider these attacks on humanitarian workers to be attacks on humanity itself.

It infuriates me.

I know I am very lucky compared to the refugees I work with.

I don't know what it's like to see my entire town destroyed.

I don't know what it's like to see a relative get shot in front of you.

I don't know what it would be like to lose state protection.

I also know that I am very lucky compared to the other hostages.

Four days before my eventful release, four hostages were beheaded miles from where I was being held.

why them?

why am i here today

There are no easy answers.

I had a lot of support from relatives, colleagues, friends and strangers.

They have helped me out of the darkness over the years.

Not everyone was treated with the same care.

How many of my colleagues have taken their own lives after the traumatic event?

The people I know personally can count.

How many of my colleagues have gone through a difficult divorce after a traumatic experience without being able to explain anything to their spouse?

I forgot the number.

This kind of life comes at a price.

In Russia, all war memorials have this beautiful inscription on the top.

It says (in Russian): "No one is forgotten, nothing is forgotten."

I have not forgotten my late colleague.

I can't forget anything.

I urge you to remember their dedication and ensure that humanitarian workers around the world are better protected.

The light of hope they brought must not be extinguished.

After my ordeal, many colleagues asked me, "But why are you continuing?"

Why are you doing this job?

why do i have to go back? ”

My answer was very simple. If I quit, the kidnappers would have won.

They would have taken my soul and my humanity.

thank you.

(applause)

I would like to talk about death and architecture.

100 years ago, we tended to die from infectious diseases such as pneumonia, and if an infectious disease were to spread, it could quickly kill us.

We tended to die in our beds at home, watched by our families, but that was the default option for many because they didn't have access to medical care.

And in the 20th century, many things have changed.

We have developed new drugs like penicillin to treat these infections.

New medical technologies were invented, such as the X-ray machine.

And they were so big and expensive that they needed large, centralized buildings to house them, and they became modern hospitals.

After World War II, many countries established universal health insurance schemes to make treatment available to all who needed it.

As a result, life expectancy has almost doubled from about 45 years earlier this century to today.

The 20th century was a time of great optimism about the possibilities science offered, but despite dramatic changes in our approach to death, life was the focus and death was forgotten.

Now, as an architect, I have spent the past year and a half observing these changes and what they mean for death and death-related architecture.

Today, we tend to die from cancer and heart disease, which means that many of us will end up with long-term chronic illnesses at the end of our lives.

During that time, we will be spending a lot of time in hospitals, hospices and care homes.

Well, we are all in modern hospitals.

You know fluorescent lights, endless corridors and rows of uncomfortable chairs.

Hospital architecture has a bad reputation.

But surprisingly, that wasn't always the case.

This is the Cathedral of Innocenti, built in 1419 by Brunelleschi, one of the most famous and influential architects of the time.

When I look at this building and think about hospitals today, what strikes me is the ambition of this building.

It's just a really nice building.

There is a courtyard in the middle, so every room has light and fresh air.

And it's also beautiful.

Somehow we forget that hospitals can do that too.

Now, if we want a better building to meet death, we have to talk about it, but we feel uncomfortable with the subject of death, so we don't talk about it, and we don't question how we as a society deal with it.

But one of the things that surprised me the most in my research was how changeable attitudes actually are.

This is Britain's first crematorium, built in Woking in the 1870s.

When this was first built, there were protests in the local village.

Cremation was socially unacceptable and 99.8 percent of people were buried.

Only 100 years later, three-quarters of us are cremated.

In fact, people are really open to changing things when given the opportunity to speak up.

So this conversation about death and architecture was what I wanted to start when I had my first exhibition in Venice in June, entitled Death of Venice.

It was designed to be very playful so that people literally go crazy for it.

This is one of our exhibits, an interactive map of London showing how much of the city's property has passed to death and is in moribund condition. Wave your hand over the map to see the name of the property, building or cemetery.

Another of our exhibits was a series of postcards that people could take home.

And they show people's homes, hospitals, cemeteries, mortuaries, and tell stories of the different spaces we go through on both sides of death.

We wanted to show that where you die is an important part of how you die.

Now, the strangest thing was the reaction of visitors to the exhibition, especially to the audio-visual works.

There were people dancing, running, jumping, trying to animate the exhibit in various ways, but at some point they stopped and remembered they were in an exhibit about death and thought that maybe that wasn't what they were supposed to be doing.

But really, I wonder if there is one way to act regarding death. If not, ask them to think about what they think a good death is, and what kind of architecture they think would support a good death. And wouldn't it be a little less, a little closer to this?

thank you.

(applause)

Conventional prescriptions for growth in Africa have not worked very well.

Although development aid to Africa reached $1 trillion over the past 60 years, real per capita income today is lower than it was in the 1970s.

Aid is not doing very well.

In response, the Bretton Woods institutions IMF and World Bank pushed for free trade rather than aid, but the historical record provides little empirical evidence that free trade leads to economic growth.

The new prescription silver bullet is microcredit.

We seem to cling to this romantic notion that every poor farmer in Africa is an entrepreneur.

(Laughter) But having traveled and worked in over 40 countries across Africa, I've found that most people are looking for work instead.

My Solution: Forget micro entrepreneurs.

Invest in developing Pan-African giants like Sudanese businessman Mo Ibrahim.

Mo founded Certel International in 1998, making a contrarian bet on Africa and by 2004 growing it into a mobile phone provider with 24 million subscribers in 14 African countries.

The Mo model may be superior to the general entrepreneurial model, which hinders effective means of dissemination and knowledge sharing.

Perhaps in Africa many actors and small firms have not yet reached the stage where they can grow through competition.

Consider the following two alternative scenarios:

One: Loans 500 banana farmers with $200 each so they can dry their surplus bananas and get 15% more profit at their local markets.

Or two: You donate $100,000 to one smart entrepreneur to help build a factory that will bring 40% extra income to all 500 banana farmers and create 50 more jobs.

We invested in the second scenario and helped 26-year-old Kenyan entrepreneur Eric Musomi establish an agro-processing plant, Stawi, to produce gluten-free banana-based flour and baby food.

Stawi leverages economies of scale and uses state-of-the-art manufacturing processes to create value not only for the owners, but also for the employees who own the business.

Our dream is to take Eric Musomi and help him become Mo Ibrahim, but it takes skill, money, regional and global partnerships, and extraordinary perseverance.

But why Pan-African?

The scramble for Africa during the Berlin Conference of 1884 – frankly, we Africans were not exactly consulted – (laughter) (applause) – resulted in massive divisions and many sovereign states with small populations. Cape Verde, 500,000 people.

The Pan-African region gives us a billion people in 55 countries with trade barriers and other obstacles, but before Europeans drew lines around us, our ancestors traded across continents.

The pan-African opportunities outweigh the challenges. That's why we're expanding Stawi's market from just Kenya to Algeria, Nigeria, Ghana, and anywhere else that buys our food.

We hope to solve food security, empower farmers, create jobs, develop local economies and prosper in the process.

This isn't the sexiest approach, and probably won't give you the same feeling of giving a woman $100 to buy a goat on kiva.org, but supporting a few, high-impact entrepreneurs building large-scale businesses that scale across Africa could help change that.

The political freedoms that our predecessors fought for are meaningless without economic freedom.

By building world-class businesses, creating wealth for Indigenous peoples, and providing much-needed jobs, we want to support, and hopefully contribute to, this fight for financial freedom.

Africa will rise.

thank you.

(Applause) Tom Riley: So, Sang, of course, this is powerful rhetoric.

We are 100 percent contrasting microcredit and regular investments to grow our regular investments.

Do you think microcredit has a role in the first place?

Sangu Delle: I think there is a role.

Microcredit is a great and innovative way to expand financial access to the bottom of the pyramid.

But when we look at the problems we face in Africa, the Marshall Plan to revitalize war-torn Europe, sheep donations alone were not enough.

We need more than microcredit.

Simply giving $200 is not enough.

We need to build a big business and we need hiring.

TR: Very good. Thank you very much.

(applause)

How many of you here have heard of PMS?

Everyone, right?

We all know that women go a little crazy right before their period, and that the menstrual cycle puts them on an inevitable hormonal roller coaster of irrationality and irritation.

There is a common assumption that fluctuations in reproductive hormones cause extreme emotions that affect the majority of women.

Now, I'm here to tell you that none of these assumptions are true, according to scientific evidence.

I'm here to bring you some good news about PMS.

But before that, let's see how firmly the idea of ​​PMS is entrenched in American culture.

If you look through the articles in newspapers and magazines, you will see how widely it is believed that everyone gets PMS.

An article in Red Book magazine, titled "You Can Be Free From PMS," informed readers that 80 to 90 percent of women suffer from PMS.

LA Muscle magazine warned readers that 40 to 50 percent of women suffer from PMS and that PMS plays a major role in women's mental and physical health, and a few years ago the Wall Street Journal also ran an article on calcium as a PMS cure, asking female readers, "Will you be a witch every month?"

With all these articles, you would think that there must be tons of research examining the pervasive nature of PMS.

However, despite 50 years of research, there is no strong consensus on the definition, causes, treatments, or even existence of PMS.

As most commonly defined by psychologists, PMS includes negative behavioral, cognitive, and physical symptoms from the time of ovulation until menstruation.

But here is where it gets tricky.

More than 150 different symptoms are used to diagnose PMS, and here are just a few of them.

Now, let me clarify here.

This is not to say that women do not have these symptoms.

My point is that the occurrence of some of these symptoms is not a mental disorder, and that label ultimately becomes meaningless when psychologists come up with very vaguely defined disorders.

With a list of symptoms this long and varied, I could get PMS, you could get PMS, the guy in the third row here could get PMS, and my dog ​​could get PMS. (Laughter) Some researchers say there must be five symptoms.

Some people said three.

Other researchers said it only makes sense if the symptoms are very uncomfortable, but others said mild symptoms are just as important.

For many years, there was no standardization in the definition of PMS, so when psychologists tried to report prevalence, estimates ranged from 5 percent of women to 97 percent of women, while at the same time few, almost everyone, had PMS.

Overall, research methods on PMS have considerable weaknesses.

First, many studies ask women to look back and report their symptoms retrospectively from memory, which is known to inflate PMS reporting compared to so-called prospective reporting, in which daily symptom records are kept for at least two consecutive months.

Also, many studies focus exclusively on middle-class white women, making it difficult to apply findings to all women.

PMS is almost unheard of outside of the Western world, so we know there is a strong cultural component to the belief in PMS.

Third, many studies were unable to use a control group.

If we want to understand the specific characteristics of women with PMS, we need to be able to compare them to women without PMS.

And finally, different types of questionnaires were used to diagnose PMS, focusing on different symptoms, duration and severity of symptoms.

To do a reliable study of any symptom, scientists need to agree on the specific characteristics that make up that symptom and everyone talks about the same thing, but this was not the case with PMS.

But in 1994, the Diagnostic and Statistical Manual of Mental Disorders, known as the DSM, thankfully also a manual for mental health professionals, redefined PMS as PMDD (Premenstrual Dysphoric Disorder).

Anxiety refers to feelings of agitation or anxiety.

And according to these new DSM guidelines, for most menstrual cycles in the past year, at least 5 out of 11 possible symptoms must have occurred in the week before the onset of menstruation. Symptoms should improve when menstruation begins. And the symptoms should disappear the week after menstruation ends.

One of these symptoms should be on a list of four: marked mood swings, irritability, anxiety, and depression.

Other symptoms may come from the first or second slide and include symptoms such as uncontrolled mood and changes in sleep and appetite.

The DSM also requires that symptoms be associated with clinically significant distress, i.e., some disturbance in work, school, or social relationships, and that symptoms and severity of symptoms be documented by daily recording for at least two consecutive cycles.

And finally, the DSM required that affective disorders be more than just an exacerbation of pre-existing disorders.

So, scientifically speaking, this is an improvement.

Currently, the number of symptoms is limited, the impact on needed function is significant, and both symptom reporting and timing are highly specific.

Using this criterion and looking at the latest research, we find that on average 3-8 percent of women suffer from PMDD.

Not all women, not most women, not the majority of women, not even many women: 3-8 percent.

For others, variables such as stressful or happy events, or even the day of the week, are stronger predictors of mood than the time of the month, information the scientific community has had since the 1990s.

In 2002, my colleagues and I published an article describing research on PMS and PMDD, and several similar articles were published in psychology journals.

The question is, why was this information not made public to the public?

Why do these myths persist?

Indeed, the onslaught of “everybody gets PMS” messages that women receive from books, TV, movies, the internet, etc., go a long way toward convincing them that it must be true.

Studies show that the more women believe everyone gets PMS, the more likely they are to falsely report that they have it.

Please tell me what you mean by "wrong".

You might ask her, "Do you have PMS?"

She said yes, but when we asked her to keep a daily record of her psychiatric symptoms for two months, we found no correlation between her symptoms and the time of the month.

Another reason the PMS myth persists has to do with the narrow boundaries of women's roles.

Feminist psychologists such as Joan Crisler have suggested that the PMS label allows women to express feelings that were previously considered unladylike.

The almost universal definition of a good woman is one who is happy, loving, caring about others, and who finds great satisfaction in her role.

Now, PMS has become your license to be angry, complain, and get annoyed without losing your good girl status.

We know that a woman is much more likely to be angered by environmental variables than by hormones, but blaming hormones for her anger absolves her of both responsibility and criticism.

"Oh, it's not her. It's out of her control."

While this is a useful tool, it also serves to neutralize a woman's emotions.

When people respond to a woman's anger with the thought, "Oh, now is the time," it severely limits their ability to take women seriously or make a difference.

So who else benefits from the PMS myth?

It can be said that the treatment of PMS has become a profitable and thriving industry.

Amazon.com currently sells over 1,900 books on PMS treatment.

A quick Google search turns up a huge number of clinics, workshops and seminars.

Reliable internet medical information sources such as WebMD and the Mayo Clinic list PMS as a known disease.

This is not a known defect, but it is listed.

It also includes a list of medications that doctors have prescribed for treatment, such as antidepressants and hormones.

Interestingly, however, both websites state that the drug's effectiveness in treating PMS symptoms varies from woman to woman.

Well, it makes no sense.

When there is a definite disease with a definite cause, like PMS, treatment should bring about improvement in many women.

This is not the case with these treatments, and FDA regulations state that a drug must show clinically significant improvement in a large proportion of the target population in order to be considered effective.

So there was none of that with these so-called remedies.

However, the economic gains in perpetuating the myth that PMS is a common and treatable mental disorder are substantial.

If a woman is prescribed drugs such as antidepressants or hormones, medical protocols require that she be followed up by a doctor every three months.

There are too many doctor visits.

Convincing women that they need to continue to take their prescribed medicines until they give birth can make huge profits for pharmaceutical companies.

Over-the-counter medications like "Midol" may even claim to treat PMS symptoms such as nervousness and irritability, even though they only contain diuretics, pain relievers and caffeine.

Now, I'm not going to argue about the magical powers of caffeine, but I don't think tension relief is one of them.

Since 2002, Midol has marketed Teen Midol to adolescents.

They target young girls early on to convince them that everyone will get PMS and it will turn you into a monster, but wait, there's something you can do about it: take middle and you'll be human again.

In 2013, Midol generated $48 million in sales revenue.

So while perpetuating the PMS myth is beneficial for some, it also has serious negative consequences for women.

First, it contributes to the medicalization of women's reproductive health.

The medical field has a long history of conceptualizing the female reproductive process as a disease that requires treatment, and this has come at many costs, such as excessive caesarean sections, hysterectomies, and prescribed hormone treatments that harm rather than enhance women's health.

Second, the PMS myth also contributes to the stereotype of women as irrational and overly emotional.

When the menstrual cycle is portrayed as a hormonal roller coaster that turns women into angry beasts, it's easy to question the capabilities of all women.

Although women have made remarkable progress in the workforce, they are still underrepresented in top-tier sectors such as government and business. When thinking about who makes a good CEO or Senator, qualities like rationality, prudence, and competence come to mind. And although in our culture it sounds more like a man than a woman, the PMS myth also contributes to that.

Psychologists know that men and women feel more alike than different.

One study followed men and women for four to six months and found no difference in the number of mood swings they experienced or the severity of those mood swings.

And finally, the PMS myth keeps women away from dealing with real issues that cause emotional upheaval.

Personal issues such as the quality of relationships and working conditions, or social issues such as racism, sexism and everyday poverty are all strongly related to our day-to-day moods.

Sweeping emotions under the PMS rug prevents women from understanding the causes of their negative emotions, but it also robs them of the opportunity to take action to change them.

The good news about PMS is that while some women experience symptoms during their menstrual cycle, most women do not develop mental illness.

They go to work and school, take care of their families, and function at a normal level.

We know that the emotions and moods of men and women are more similar than different, so it's time to move away from the tired old PMS myth that women are witches and embrace the reality of highly emotional and professional functioning that the majority of women live with every day.

thank you.

(applause)

We are made of very small things, but we are embedded in a very large universe. In fact, we are not very good at making sense of reality on either scale. That's because our brains haven't evolved to understand the world at that scale.

Instead, we are trapped in a very thin slice of perception in the middle.

But strangely enough, even in the part of reality we call home, we don't see most of the action taking place.

Now let's see the colors of our world.

These are light waves, electromagnetic radiation that bounces off objects and hits special receptors in the back of our eyes.

But not all waves are visible.

In fact, what we see is less than 1/10 trillion of what is there.

So you have radio waves, microwaves, x-rays, gamma rays passing through your body right now, but you are completely unaware of it because you do not have the proper biological receptors to sense it.

Thousands of mobile phone conversations are passing you by now, and you are completely unaware of it.

Now, it's not that these things are inherently invisible.

A snake's reality includes infrared light, and a bee's worldview includes ultraviolet light. Of course, we built machines in car dashboards to receive signals in the radio frequency range, and we built machines in hospitals to receive signals in the X-ray range.

However, it is not equipped with the appropriate sensors, so at least for now, it is not possible to sense these things on its own.

Now, what this means is that our experience of reality is biologically constrained, which goes against the common sense notion that our eyes, ears, and fingertips are just picking up on the objective reality out there.

Instead, our brains are sampling just a fraction of the world.

Now, across the animal kingdom, different animals perceive different parts of reality.

So in the blind and deaf world of ticks, the key signals are temperature and butyric acid. In the world of Black Ghost Knifefish, the sensory world is lavishly colored by electric fields. And in the case of echolocation bats, that reality is constructed from compressed waves of air.

It's part of an ecosystem they can recognize, and science has a word for this.

It is called Umwaka, which means the world around us in German.

Now, perhaps all animals assume that their Umwelt is the entire objective reality out there. For why should we stop to imagine that there is something beyond what we can perceive?

Instead, what we all do is accept reality as it is presented to us.

Let's do something to raise awareness about this.

Imagine you are a bloodhound dog.

Everything in your world is a smell.

The long human nose has 200 million odor receptors, moist nostrils that attract and trap odor molecules, and slits in the nostrils that allow large air intakes.

For you, it's all about scent.

So one day you have a revelation and stop.

You look at your human owner and think, "What would it be like to have a poor, poor human nose?"

(Laughter) What does it feel like to breathe a little weak air through your nose?

How can you not know that there is a cat 100 meters away, or that your neighbor was right here six hours ago? ”

(Laughter.) I mean, because we're human, we haven't experienced that world of smells, and we're so firmly entrenched in the ummworld that we don't miss it.

But the question is, do we need to stick there?

As a neuroscientist, I am therefore interested in how technology expands our umwelt and how it changes the experience of being human.

So, with hundreds of thousands of people walking around wearing artificial hearing and vision, we already know that technology and biology can be combined.

How it works is by using a microphone to digitize the signal and inserting electrode strips directly into the inner ear.

Alternatively, a retinal implant takes a camera, digitizes the signal, and connects an electrode grid directly to the optic nerve.

And as recently as 15 years ago, many scientists thought these technologies wouldn't work.

why? That's because these technologies speak the language of Silicon Valley, and it's not exactly the same dialect as our natural biological senses.

But in practice it works. The brain understands how to use signals to its advantage.

So how do we make sense of it?

Well, here's the big secret. Your brain doesn't hear or see any of these things.

Your brain is locked in a vault of silence and darkness inside your skull.

Only incoming electrochemical signals along the various data cables are detected. That's all it can handle and you don't need more.

Now, surprisingly, the brain is very good at receiving these signals, extracting patterns, and assigning meaning. So the brain takes out this inner universe and puts together a story of this subjective world.

But here's the important point. The brain doesn't know or care where it gets its data from.

Whatever information comes in, just decide what to do with it.

And this is a very efficient kind of machine.

It's essentially a general-purpose computing device that takes everything in and decides what to do with it. I think this will free up Mother Nature to play around with different kinds of input channels.

That's why I call it PH. I don't want to get too technical here, but P.H. stands for Potato Head, and I used the name to say that the eyes, ears, fingertips, sensors we all know and love are simply peripheral plug-and-play devices. Just plug it in and you're ready to go.

The brain decides what to do with incoming data.

And if you look around the animal kingdom, you'll find plenty of peripherals.

So snakes have thermal pits to detect infrared light, ghost knifefish have electroreceptors, and star-nosed moles have 22-fingered appendages that they use to sense their surroundings and build 3D models of the world. Many birds also have magnetite, which allows them to orient in the direction of the planet's magnetic field.

What this means is that nature does not have to continuously redesign the brain.

Instead, with the brain's working principles established, all nature has to worry about is designing new peripherals.

have understood. So what this means is that the lesson that has surfaced is that there is nothing really special or fundamental about the biology we are going to discuss.

It's just something we inherited from our complex evolutionary path.

But that's not something we have to stick to, and the best proof of this principle comes from so-called sensory substitution.

It refers to sending information to the brain through abnormal sensory channels, and the brain just needs to figure out what to do with it.

Now, this may sound speculative, but the first paper demonstrating this was published in the journal Nature in 1969.

There, a scientist named Paul Bach y Rita puts a blind person in a modified dental chair, sets up a video feed, puts something in front of the camera, and you can feel a grid of solenoids piercing your back.

So when you wiggle your coffee cup in front of the camera, you feel it on your back. Amazingly, blind people can now determine what's in front of the camera just by feeling a small part of their back.

Well, there are many modern examples of this.

Sonic Glasses take the video feed in front of you and turn it into a soundscape, so you hear things like "Bzz, bzz, bzz" as things move around, come closer or farther away.

It sounds like a cacophony, but after a few weeks, a blind person can get pretty good at making sense of what's in front of them just from the sounds they hear.

And it doesn't have to be through the ear. The system uses an electrotactile grid on your forehead, so anything in front of the video feed will be felt on your forehead.

why the forehead? Because I don't use it much for anything else.

The most modern is called a brain port, a tiny electrical grid that sits on your tongue and converts your video feed into tiny electro-tactile signals that help blind people get better at throwing balls into baskets and navigating complex obstacle courses.

They will be able to see things through their tongue.

It's totally insane, isn't it?

But remember, vision is all about electrochemical signals running through your brain.

Your brain doesn't know where the signal came from.

It's just a matter of figuring out what to do with them.

Thus, my interest in my lab is sensory substitution for the deaf, and this is a project I worked on with a graduate student in my lab, Scott Novitch, who is leading this research on a dissertation.

And this is what we wanted to do. I wanted to be able to convert the sounds from the world in some way so that deaf people could understand what they were saying.

And given the power and ubiquity of portable computing, we wanted to make this happen. We wanted to make sure we could do this on phones and tablets. We also wanted it to be wearable, meaning that it could be worn under clothes.

This is the concept.

So when I'm talking, my voice is captured by the tablet and mapped onto a vest covered in vibrating motors, just like the motors in your phone.

In other words, when I speak, the sound is transformed into the best vibration pattern.

Now, this is more than just a conceptual story. The tablet is transmitting Bluetooth and I'm wearing a vest right now.

As I speak, (applause) the sound is translated into dynamic vibration patterns.

I feel the world of sounds around me.

So, we're currently testing this with deaf people, and we've found that after just a little bit of time, people start to feel and understand the best language.

So here is Jonathan. he is 37 years old. he has a master's degree

He was born severely deaf, which means that parts of his Umwelt are unavailable to him.

So I had Jonathan wear the vest and train 2 hours a day for 4 days. And this is what it looked like on day five.

Scott Novitch: You.

David Eagleman: So when Scott says the word, Jonathan feels it best and writes it on the board.

SN: Where are you? where.

DE: Jonathan can translate this complex vibrational pattern to understand what is being said.

SN: Touch it. touch.

DE: Now he's not doing this -- (applause) -- Jonathan isn't doing this consciously. Because the pattern is too complicated. But his brain is starting to unravel patterns that can make sense of the data. And our hope is that, after wearing it for about three months, we will have a direct sensory experience of hearing, in the same way that a blind person holding his finger over Braille sees meaning coming straight from the page without any conscious intervention.

The only other solution to hearing loss is a cochlear implant, which requires invasive surgery, so this technology has the potential to be a game changer.

And because it costs 40 times less to manufacture than a cochlear implant, the technology is open to the world, including the poorest countries.

Now, while we've been very encouraged by the results on sensor substitution, it's sensor addition that we've been thinking a lot about.

How can we use technology like this to add entirely new kinds of sensations and extend the human sphere?

For example, can real-time data from the internet be fed directly into someone's brain to develop a direct perceptual experience?

Here is an experiment that we are doing in the lab.

Subjects felt a real-time streaming feed from a net of data for 5 seconds.

Next, two buttons will appear and prompt you to make a choice.

I don't know what's going on with him.

He makes a choice and receives feedback after a second.

Well, here's the problem: Subjects don't know what all the patterns mean, but they check to see if they're getting better at figuring out which button to press.

He doesn't know that we're giving him real-time data from the stock market to make buying and selling decisions.

(Laughter) And feedback will tell us if he did the right thing.

And what we're looking at is whether it's possible to extend the human annulus so that in a few weeks we'll be able to directly perceive the dynamics of the Earth's economy.

So I'll report later how well this works.

(Laughter) That's another thing we're doing. During my talk this morning, I automatically scraped Twitter for TED2015 hashtags and did some automated sentiment analysis. That is, are people using positive words, negative words, or are they neutral?

And I've been feeling this while this is happening, so I'm connected to the collective emotions of thousands of people in real time, and it's a new kind of human experience, because now I can know how everyone is doing and how much you love this.

(Laughter) (Applause) It's a bigger experience than a normal human being can have.

The frame of the pilot is also expanding.

In this case, Best is streaming 9 different measurements from this quadcopter, improving pitch, yaw, roll, heading and heading to improve this pilot's manoeuvrability.

It's essentially like he's stretching his skin too far.

And that's just the beginning.

We imagine being in a modern cockpit full of instruments and feeling it instead of trying to read it all.

We live in an information world now, but there is a difference between accessing big data and experiencing it.

So I think the potential for human augmentation is truly endless.

Imagine astronauts being able to feel their overall health on the International Space Station, or for that matter, their own invisible health, such as blood sugar levels and microbiome status, and be able to see in 360-degree vision, infrared, and ultraviolet.

So this is what matters. Looking to the future, we will increasingly be able to choose our own peripherals.

We no longer have to wait on her timescale for the gifts of Mother Nature's senses. Instead, like any good parent, she gives us the tools we need to get out and define our own trajectory.

Now the question here is how do you want to go out and experience your own universe?

thank you.

(Applause) Chris Anderson: Can you feel it? De: Right.

Actually, it was the first time that I felt applause from the best.

nice. It's like a massage. (laughs) CA: Twitter is going crazy. Twitter is going crazy.

It's a stock market experiment.

If this succeeds, it could be the first experiment that secures funding forever, right?

DE: Well, you don't have to write to the NIH anymore.

CA: Well, let me be a bit skeptical, which is surprising, so far the evidence is not that sensory substitution works, and sensory addition doesn't necessarily work?

So could a blind person be able to see through the tongue because the visual cortex is still there, ready for processing, and needed as part of it?

DE: That's a great question. In fact, we have no idea what the theoretical limits are on what kind of data the brain can take in.

However, the general story is that they are very flexible.

So when a person goes blind, what we used to call the visual cortex is taken over by something else, like touch, hearing, or vocabulary.

So it turns out that cortex is like a one-trick pony.

It just performs certain kinds of calculations on things.

And if you look around Braille, for example, people get information through the projections on their fingers.

Therefore, I see no reason to think there is a theoretical limit that we know the limit for.

CA: If this becomes a reality, there will be a deluge.

There are numerous possible applications for this.

Are you ready? What are you most excited about and where is it going?

DE: So I think there are a lot of applications here.

Beyond sensory substitution, in terms of what I started saying about space station astronauts, they spend a lot of time watching things and instead just need to figure out what's going on. Because it's multidimensional data where this really helps.

The important thing is this. Our visual system is great at detecting blobs and edges, but it's really bad at our world: screens with lots of data.

We need to crawl it using our attention system.

So this is a way to feel the state of something, much like how you know the state of your body when you're standing.

So I think heavy equipment, safety, feeling the condition of factories and equipment is one of the quick fix places.

CA: David Eagleman, that was a shocking talk. thank you very much.

DE: Thank you Chris. (applause)

I'm happy to be here tonight to share with you what we've been working on for over two years. It is the field of additive manufacturing, also known as 3D printing.

You will see this object here.

It looks very simple, but at the same time it is very complicated.

It is a series of concentric geodesic structures with links between each structure.

In that sense, it cannot be manufactured with conventional manufacturing technology.

Due to symmetry, injection molding is not possible.

It cannot be produced even by milling.

This is a 3D printer job, but most 3D printers take 3-10 hours to produce. Tonight I'll take the risk and try to manufacture it on stage during this 10 minute talk.

I wish you good luck.

Now, 3D printing is actually a misnomer.

It's actually a lot of iterations of 2D printing, and it actually uses technology related to 2D printing.

Consider inkjet printing. I put ink on the page to make letters and repeat it over and over to build a three-dimensional object.

Microelectronics does the same thing, creating transistors and integrated circuits, and building structures multiple times using something called lithography.

These are all 2D printing technologies.

Now I am a chemist and materials scientist. My co-inventors are also materials scientists, one a chemist and one a physicist, and we started getting interested in 3D printing.

And, as you know, new ideas often come from simple connections between people with different experiences in different communities. That's our story.

Well, we took inspiration from the T-1000 scene in "Terminator 2" and wondered why we couldn't make a 3D printer work this way and make objects emerge from puddles essentially in real-time, essentially waste-free, to create amazing objects.

Well, just like in the movies.

And can we take inspiration from Hollywood and come up with a way to actually make this happen?

And that was our challenge.

And our approach is that if we can do this, we can fundamentally address three issues that prevent 3D printing as a manufacturing process.

The first is that 3D printing takes time.

Some mushrooms grow faster than 3D printed parts. (Laughter) Layer-by-layer processing introduces defects in mechanical properties, but if we can grow continuously, we can eliminate those defects.

And indeed, if we could grow really fast, we could even start using self-hardening materials and get amazing properties.

So if we can emulate Hollywood and make this happen, we can actually tackle 3D manufacturing.

Our approach is to use standard knowledge of polymer chemistry to utilize light and oxygen to continuously grow parts.

Light and oxygen work differently.

Light can take resins and transform them into solids, or liquids into solids.

Oxygen inhibits that process.

Therefore, light and oxygen are diametrically opposed to each other from a chemical point of view, and if we can control light and oxygen spatially, we may be able to control this process.

This is called CLIP. [Fabrication of a continuous liquid interface. ] It has three functional components.

For one, it has a reservoir that holds a puddle, just like the T-1000.

At the bottom of the reservoir there is a special window.

Back to the story.

In addition, it also has a stage that descends into a puddle and lifts the object out of the liquid.

The third component is a digital light projection system below the reservoir, illuminated with light in the ultraviolet range.

Now, the point is that this window at the bottom of this reservoir is a composite window, a very special window.

Not only is it permeable to light, but it is also permeable to oxygen.

It has the properties of a contact lens.

So you can see how the process works.

If you turn the stage down there, you'll find that the traditional process with oxygen-impermeable windows creates a two-dimensional pattern, which you end up applying to a traditional window pane. So to introduce the next layer you have to separate the layer, introduce a new resin, change the position and repeat the process over and over.

But with our very special window, when the light hits it, oxygen comes in from the bottom so oxygen can inhibit the reaction and create dead zones.

The thickness of this dead zone is on the order of tens of microns, which corresponds to a few red blood cell diameters. At the interface of the window, which remains liquid, pulls this object up. As we discussed in the Science paper, changing the oxygen content can change the thickness of the dead zone.

So we control many important variables such as oxygen content, light, light intensity, cure rate, viscosity, shape, etc. We use very sophisticated software to control this process.

The results are pretty amazing.

It's 25-100 times faster than traditional 3D printers, which is revolutionary.

In addition, I believe its ability to feed liquid to its interface allows it to travel 1,000 times faster. This creates the opportunity to actually generate a lot of heat. As a chemical engineer, I am very excited about heat transfer. Also, water-cooled 3D printers are very fast, so I'm excited about the idea that we might one day have a water-cooled 3D printer.

Also, since it is something that grows, layers are eliminated and the parts are monolithic.

No surface structure is visible.

It has a molecularly smooth surface.

Also, the mechanical properties of most 3D-printed parts are known to be direction dependent during printing due to their layered structure.

However, when growing an object in this way, the properties do not change with orientation.

Although they look like injection molded parts, they are very different from traditional 3D manufacturing.

Additionally, entire polymer chemistry textbooks can be leveraged for this, allowing you to design chemistries that produce the properties you really want in your 3D printed objects.

(Applause) Yes. That is wonderful.

You always run the risk that something like this will go wrong on stage, right?

However, materials with excellent mechanical properties can be obtained.

For the first time, it is now possible to achieve highly elastic or damping elastomers.

Think vibration control or a good pair of sneakers, for example.

We can make materials with incredible strength, high strength-to-weight ratios, really strong materials, really good elastomers, so throw that in the audience.

Very good material properties.

And now is your chance. By actually creating a part with the properties that make it the final part, and doing it at breakthrough speeds, you can actually transform manufacturing.

What is happening in manufacturing today is the so-called digital thread in digital manufacturing.

We handle everything from CAD drawings to design, prototyping, and manufacturing.

Digital threads are often suspended at the point of prototyping. This is because most parts do not have the properties of a final part and cannot proceed to manufacturing.

We can now connect the digital thread from design to prototyping to manufacturing, and the opportunities really open up all sorts of things, from fuel-efficient cars dealing with superior lattice properties with high strength-to-weight ratios, to new turbine blades, to all kinds of awesome stuff.

Consider if you need a stent in an emergency. A doctor pulls a standard-sized stent off the shelf, prints a stent with tributaries to his anatomy in real-time from the property in an emergency, and has what the stent might disappear in 18 months. This is truly a game changer.

You can even create such structures with digital dentistry or even while sitting in the dentist's chair.

And look at the structures my students are building at the University of North Carolina.

These are amazing microscale structures.

As you know, the world is very good at nanofabrication.

Moore's Law has enabled 10 microns and below.

We're good at that, but it's actually very difficult to make things on the mesoscale of 10 microns to 1,000 microns.

And the silicon industry's subtractive technology just can't do it very well.

They can't etch wafers that well.

But the process is so gentle that additive manufacturing can be used to grow these objects from the bottom up and create amazing things in tens of seconds, opening up really revolutionary things like new sensor technologies, new drug delivery technologies, new lab-on-a-chip applications.

The opportunity to create parts in real-time with the properties that will become the final part really expands the possibilities of 3D manufacturing. For us this is very exciting. Because it really owns the intersection between hardware, software and molecular science. We can't wait to see what designers and engineers around the world will be able to do with this amazing tool.

Thank you for listening.

(applause)

You are looking at a woman who has been quiet in public for ten years.

Things have obviously changed, but only recently.

It was a few months ago that I gave my first big talk at the Forbes 30 Under 30 Summit. There were 1,500 attendees, all excellent people under the age of 30.

In 1998, the oldest member of the group was only 14 years old and the youngest was only 4 years old.

I joked to them that some may have only heard of me through rap songs.

Yes, I am in charge of rap songs.

(laughs) I have nearly 40 rap songs.

(Laughter.) But the night of my speech, something amazing happened.

When I was 41, I was picked up by a 27-year-old man.

(laughs) You know what?

He was charming, and I flattered him, but I declined.

Do you know what his failed pick-up line was?

He might make me feel 22 again.

(Laughter.) (Applause.) I realized later that night that I was probably the only person over 40 who didn't want to go back to being 22.

(Laughter) (Applause) At 22, I fell in love with my boss.

And at the age of 24, I saw the dire consequences.

Now, can you show me the hands of someone who didn't make a mistake or do something they regretted when they were 22?

yes. I thought so too.

So, like me at 22, you may have taken the wrong turn and ended up liking the wrong person, possibly your boss.

However, unlike me, your boss probably wasn't the President of the United States.

(Laughter) Of course, life is full of surprises.

Not a day goes by that I am not reminded of my mistake and I deeply regret it.

In 1998, after being embroiled in an improbable romance, I was embroiled in political, legal, and media mayhem unlike anything I've ever seen.

Remember, just a few years ago, news was consumed in just three places: reading newspapers and magazines, listening to the radio, and watching TV.

that was it.

But it wasn't my destiny.

Rather, this scandal was brought about by the digital revolution.

This means you can now access all the information you need, anytime, anywhere.

And when this story was reported in January 1998, it became a hot topic on the Internet.

This was the first time that traditional news had been picked up by the Internet as a major news story, and the clicks were heard all over the world.

What that means for me personally is that overnight I went from being completely private to being publicly humiliated all over the world.

I just couldn't stand losing my personal reputation on a global scale almost instantly.

This technology-enabled decision-making haste has sparked a virtual trebuchet mob.

Sure, it was before social media, but people were still able to comment online, email articles, and of course, email cruel jokes.

News sources plastered my picture here and there to sell newspaper and banner ads online and to keep people focused on TV.

Remember that particular image of me wearing a beret for example?

Now I admit I made mistakes, especially wearing a beret.

(Laughter.) But the attention and recognition that I received—not for the story, but for me personally—was unprecedented.

I was labeled a vagrant, a bad guy, a slut, a whore, a slut, and of course "that woman."

Many people saw me, but few actually knew me.

I understand that. It was easy to forget that the woman had dimensions, had a soul, and was once indestructible.

When this happened to me 17 years ago it had no name.

Now we call it "cyberbullying" and "online harassment."

Today, I would like to share some of my experiences with you, how they have helped shape my cultural observations, and how I hope my past experiences will lead to change that will result in less suffering for others.

In 1998 I lost my reputation and dignity.

I lost almost everything.

And I almost lost my life.

let me draw a picture for you

It was September of 1998.

I am sitting in a windowless office in the Independent Advisory Office, under a booming fluorescent light.

I hear my own voice, a secretly recorded phone call made a year ago by a supposed friend.

I'm here because I'm legally required to personally authenticate every 20 hours of recorded conversation.

For the past eight months, the mystical content of these tapes has hung over my head like the sword of Damocles.

I mean, who remembers what they said a year ago?

Scared and mortified, I listen and listen as I chat about the flotsam and jetliners of the day. Hear my love for the president and of course my confession of heartbreak. Listen to yourself, sometimes feline, sometimes surly, sometimes stupid, cruel, unforgiving, uncouth. Listen, deeply, deeply ashamed to tell you the worst version of yourself, the one you don't even recognize.

A few days later, the Star Report will be released to Congress, and those tapes, records, and stolen words will all form part of it.

The mere fact that people can read the records is terrifying enough.

A few weeks later, however, the audiotape was aired on television and a good portion was made available online.

The public humiliation was intolerable.

Life was almost unbearable.

This wasn't something that happened regularly back in 1998. "This" means stealing people's private words, actions, conversations and photos and making them public. Publishing without consent, publishing without context, publishing without compassion.

Twelve years later, in 2010, social media was born.

Sadly, whether or not someone actually made a mistake, there are far more cases like mine in this world, and now it is directed at both public and private people.

The consequences for some have been dire, very dire.

In September 2010, I was on the phone with my mom about the news of a young college freshman named Tyler Clementi at Rutgers University.

Gentle, sensitive, and creative, Tyler was secretly caught on webcam by her roommate while having an intimate relationship with another man.

When the online world learned of the incident, ridicule and cyberbullying flared up.

A few days later, Tyler died after jumping off the George Washington Bridge.

he was 18 years old.

My mother lost herself in the thought of what had happened to Tyler and her family, but she was overwhelmed with pain that I could never comprehend.

And finally, I found her reliving 1998. I relive the times when she sat by my bed every night, and—(choked) sorry—when she showered me with the bathroom door open, and I relive the times when my parents were afraid I would be humiliated to death literally.

Too many parents today do not have the opportunity to step in and save their loved ones.

Too many people find out about the suffering and humiliation of their children too late.

Tyler's tragic and unjust death was a turning point for me.

It helped recontextualize my experience, and then I turned to the world of humiliation and bullying around me to see something different.

In 1998, we had no idea where this wonderful new technology called the Internet would take us.

Since then, we've joined our lost brothers, saved lives, started revolutions, and brought people together in unimaginable ways...

However, the darkness, cyberbullying, and sexual harassment that I experienced has exploded.

Every day online, people, especially young people who are developmentally incapable of coping with this, are abused and humiliated in ways they cannot imagine living the next day.

And, sadly, some people don't.

And nothing about it is virtual.

British non-profit Childline, which focuses on helping young people with a range of issues, released a startling statistic late last year. Between 2012 and 2013, the number of calls and emails related to cyberbullying increased by 87%.

A meta-analysis conducted in the Netherlands showed for the first time that cyberbullying was more associated with suicidal ideation than offline bullying.

And you know, what shocked me – and it wasn't supposed to – was another study last year that found humiliation to be a stronger emotion than happiness or anger.

Cruelty to others is nothing new.

But online, the tech-enhanced shaming is amplified, uncontained, and permanently accessible.

The repercussions of shame used to reach only families, villages, schools and communities.

But now it's an online community too.

Millions of people, often anonymous, can stab you verbally, and it's very painful.

And there are no boundaries on how many people can publicly observe you and lock you in a public fence.

Public humiliation comes with a very personal price, and the rise of the internet has made that price even greater.

For nearly two decades, we have slowly sown the seeds of shame and public humiliation in our cultural soil, both online and offline.

Gossip websites, paparazzi, reality shows, politics, the press, and sometimes hackers all traffic with shame.

It creates an environment of desensitization and tolerance online that fosters trolling, invasion of privacy, and cyberbullying.

This change has created what Professor Nicholas Mills calls a "culture of humiliation."

Consider a few notable examples in the last six months alone.

Snapchat is primarily used by younger generations, with messages claiming to have a lifespan of just a few seconds.

You can imagine the range of content it can get.

A third-party app that Snapchatters use to store the lifespan of their messages was hacked, exposing 100,000 private conversations, photos and videos online with their lifespan preserved forever.

Jennifer Lawrence and several other actors had their iCloud accounts hacked and private and intimate nude photos distributed around the internet without their permission.

One gossip website had over 5 million hits for this article alone.

So what about the Sony Pictures cyber hack?

The document that received the most attention was a private email that was most worthy of public humiliation.

But in this culture of humiliation, public humiliation comes with a different kind of price tag.

While this price does not measure the victim price paid by Tyler and many others, especially women, minorities and members of the LGBTQ community, the price is indicative of the benefits of those who prey on them.

This invasion of others is a raw material, efficiently and ruthlessly mined, packaged and sold for profit.

A market has emerged where public humiliation has become a commodity and shame has become an industry.

How is money made?

click sound.

The more embarrassing, the more clicks.

The more clicks you get, the more you spend on advertising.

We are stuck in a dangerous cycle.

The more we click on this kind of gossip, the more numb we become to the human life behind it.

And the more numb you are, the more you click.

All the while, someone is making money out of someone else's suffering.

With each click we make a choice.

The more our culture becomes saturated with public shaming, the more it becomes acceptable, and the more acts such as cyberbullying, trolling, some form of hacking, and online harassment.

why? Because they all have an underlying humiliation.

This behavior is a symptom of the culture we have created.

Think about it.

Behavior change begins with evolving beliefs.

We have seen that true in racism, homophobia, and many other prejudices, both now and in the past.

As we change our beliefs about same-sex marriage, more people are given equal freedom.

When we started focusing on sustainability, more people started recycling.

So as far as our culture of humiliation is concerned, what we need is a cultural revolution.

Public shaming as a blood sport should stop and it's time to intervene with the internet and our culture.

The shift starts out easy, but it's not easy.

We need to return to the long held values ​​of compassion, compassion and empathy.

There is a lack of compassion, a crisis of empathy online.

Researcher Brené Brown said: I also quote, "Shame cannot bear empathy."

Shame can't stand empathy.

I have seen very dark days in my life.

What saved me was the compassion and empathy from family, friends, professionals, and sometimes even strangers.

Even the empathy of one person can make a difference.

Minority influence theory, developed by social psychologist Serge Moscovici, argues that even minorities can change over time if they are consistent.

In the online world, we can increase the influence of minorities by being powerful.

Standing out instead of being indifferent on the sidelines means posting a positive comment or reporting a bullying situation to someone.

Believe me, thoughtful comments can help soothe negative feelings.

We can also counter this culture by supporting groups that work on these kinds of issues, like the Tyler Clementi Foundation in the United States. In the UK we have Anti-Bullying Pro. And Australia has PROJECT ROCKIT.

We often talk about the right to freedom of expression.

But we need to talk more about our responsibility for freedom of expression.

We all want to be heard, but recognize the difference between speaking with intent and speaking for attention.

The Internet is the highway of identity.

But online, showing empathy for others benefits us all and helps build a safer and better world.

We need to communicate thoughtfully online, consume news thoughtfully, and click thoughtfully.

Imagine walking a mile in someone else's headline.

I would like to end with a personal story.

Over the past nine months, the question I've been asked the most is "why?".

why now?

You can read between the lines of those questions, but the answers have nothing to do with politics.

The best answer, both now and then, is “because the time has come”.

There's a time when I stop sneaking around my past, a time when I stop living a life of condemnation, and it's time to take back my story.

It doesn't just save itself.

Anyone who suffers from shame or public humiliation should know one thing. It means you can survive it.

I know it's difficult.

It may not be painless, fast, or easy, but you can ask for a different ending for your story.

Be kind to yourself.

We all have a right to be compassionate and need to live in a more compassionate world, online and offline.

Thank you for listening.

(applause and cheers)

Let me show you something.

(Video) Girl: Yes, it's a cat sitting on the bed.

A boy is stroking an elephant.

They are the people who fly.

That's a big plane.

Feifei Li: This is a 3 year old describing what he saw in a series of pictures.

She may still have a lot to learn about this world, but she's already an expert in the all-important task of making sense of what she sees.

Our society is more technologically advanced than ever before.

We'll send people to the moon to build phones that talk to us and customize radio stations that play only the music they love.

But our state-of-the-art machines and computers still struggle with this task.

So I'm here today to give a progress report on the latest advances in research into one of the most cutting-edge and potentially transformative technologies in computer science: computer vision.

Yes, we've developed a prototype car that can drive itself, but without smart vision you can't really tell the difference between a crumpled paper bag on the road that you might run over and a stone that size you should avoid.

We've made great megapixel cameras, but we haven't been able to provide vision for the blind.

Drones can fly over vast tracts of land, but they don't have enough vision technology to help track changes in rainforests.

Surveillance cameras are everywhere, but they don't warn you if your child drowns in the pool.

Photos and videos are becoming an integral part of life in the world.

They're being generated at a pace far beyond what humans or teams of humans want to see, and you and I are contributing to that here at TED.

However, our state-of-the-art software still struggles to understand and manage this vast amount of content.

So, as a society as a whole, we are mostly blind. Because even our smartest machines are still blind.

"Why is this so difficult?" you may ask.

A camera can take such pictures by converting light into a two-dimensional array of numbers called pixels, but these are just numbers without substance.

They have no meaning by themselves.

Hearing is not the same as listening, and photographing is not the same as seeing. And seeing means really understanding.

In fact, it took Mother Nature 540 million years of effort to do this, much of that effort was spent developing the brain's visual processing apparatus, not the eye itself.

So although vision starts in the eye, it actually takes place in the brain.

It's been 15 years since I got my doctorate. After studying at Caltech and leading the Vision Lab at Stanford University, I've worked with mentors, collaborators, and students to teach computers to see.

Our research field is called computer vision and machine learning.

This is part of the general field of artificial intelligence.

Ultimately, therefore, we want to teach machines to see like we do, including naming objects, identifying people, inferring the 3D shape of things, and understanding relationships, emotions, actions, and intentions.

You and I weave the whole story together the moment we set our eyes on people, places and things.

The first step towards this goal is to teach computers how to see the objects that make up the visual world.

In its simplest terms, imagine this teaching process as showing a computer some training images of a particular object (let's say a cat) and designing a model to learn from these training images.

How hard can this be?

After all, a cat is just a collection of shapes and colors, and this is what we did in the early days of object modeling.

We tell the computer algorithm in math language that the cat has a round face, a chubby body, two pointy ears, and a long tail, and it all looks fine.

But what about this cat?

(laughs) You're curled up.

Now we need to add another shape and perspective to the object model.

But what if the cat is hiding?

What about these stupid cats?

Now you know what I mean.

Even something as simple as a domestic pet can have infinite variations in the object model, but it's just one object.

So about eight years ago, a very simple and profound observation changed my mind.

No one teaches a child how to see things, especially in early childhood.

They learn this through real-world experiences and examples.

If you think of a child's eyes as a pair of biological cameras, one picture is taken about every 200 milliseconds, which is the average eye movement time.

So by the age of three, children will have seen hundreds of millions of real-world photographs.

There are many training examples.

So instead of just focusing on better and better algorithms, it was my insight to give them the kind of training data that kids are given through both quantitative and qualitative experiences.

Once we realized this, we knew we needed to collect a much larger data set, perhaps thousands of times more images than we had previously, and in 2007 we launched the ImageNet project in collaboration with Professor Kai Li of Princeton University.

Luckily, I didn't have to wait years with a camera on my head.

We went to the Internet, the greatest treasure trove of photographs mankind has ever created.

We downloaded approximately 1 billion images and labeled them using crowdsourcing technologies such as the Amazon Mechanical Turk platform.

In its heyday, ImageNet was one of the largest employers of Amazon Mechanical Turk employees. Nearly 50,000 employees from 167 countries around the world worked together to help clean, classify, and label nearly a billion candidate images.

That's how much effort it took to capture just a fraction of the images that popped into a child's mind early in development.

In retrospect, this idea of ​​using big data to train computer algorithms may seem obvious now, but it wasn't so obvious in 2007.

We spent quite a lot of time alone on this trip.

Some very friendly colleagues advised me to do more useful things during my tenure, but we always struggled to get research funding.

Once, I even joked with a graduate student that I was going to reopen my dry cleaners to fund ImageNet.

After all, that's how I paid for my college years.

So we continued.

In 2009, the ImageNet project provided a database of 15 million images of 22,000 classes of objects and things organized by everyday English words.

The scale was unprecedented in both quantity and quality.

For cats, for example, there are over 62,000 cats in all kinds of looks and poses, both domestic and wild.

We were thrilled to have ImageNet put together, and wanted the entire research world to benefit from it, so we made the entire dataset available to the global research community for free, in a TED way.

(Applause.) Now that we have the data to feed the computer's brain, we're ready to get back to the algorithm itself.

After all, the wealth of information provided by ImageNet was a perfect match for a particular class of machine learning algorithms called convolutional neural networks, pioneered by Kunihiko Fukushima, Jeff Hinton, and Yang Lucan in the 1970s and 80s.

Just as the brain is made up of billions of highly connected neurons, the basic operating units of neural networks are neuron-like nodes.

It receives inputs from other nodes and sends outputs to other nodes.

Moreover, these hundreds of thousands and even millions of nodes are organized hierarchically, similar to the brain.

A typical neural network used to train an object recognition model has 24 million nodes, 140 million parameters, and 15 billion connections.

It's a huge model.

With massive amounts of data from ImageNet and modern CPUs and GPUs to train such huge models, convolutional neural networks have blossomed in ways no one expected.

This has become a winning architecture that yields exciting new results in object recognition.

This is because this photo contains a cat and the computer will tell you where the cat is.

Of course, there are many other things besides cats. A computer algorithm tells you that this photo contains a boy and a teddy bear. A dog, a person and a small kite in the background. Or pictures of very busy things like men, skateboards, railings, streetlights.

Sometimes we've taught computers to be smart enough to give safe answers instead of committing too much when they're not so confident in what they see, just like we do, but other times it's amazing how our computer's algorithms tell us exactly what an object is, be it a car make, model or year.

We applied this algorithm to millions of Google Street View images across hundreds of US cities. And it turned out to be very interesting. First, it confirms our conventional wisdom that car prices correlate very well with household income.

Surprisingly, however, car prices also correlate well with city crime rates and zip code voting patterns.

So wait a minute. is that so?

Are computers already matching or even surpassing human capabilities?

not so soon

So far, we've only taught the computer how to see objects.

This is similar to how small children learn to pronounce some nouns.

This is an incredible achievement, but it's only the first step.

Soon, another developmental milestone is reached and the children begin to communicate in sentences.

So instead of saying that this is the cat in the picture, you already hear a girl saying that this is the cat lying on the bed.

Teaching computers to look at images and generate sentences therefore requires another step in the fusion of big data and machine learning algorithms.

Computers now need to learn from both human-generated natural language sentences as well as images.

We developed a model that associates parts of visuals, such as visual snippets, with words and phrases in sentences, much like the brain integrates vision and language.

About four months ago, we finally put all this together and created one of the first computer vision models that could generate human-like text when seeing an image for the first time.

Now I'm ready to explain what the computer says when it sees the picture the girl saw at the beginning of this story.

(Video) Computer: A man stands next to an elephant.

Big plane sitting on the airport runway.

FFL: Of course, we are still working hard to improve our algorithms, but we still have a lot to learn.

(Applause.) And computers still make mistakes.

(Video) Computer: A cat lying on a bed with a blanket.

FFL: Of course, I think that if there are too many cats, everything might look like cats.

(Video) Computer: A boy is holding a baseball bat.

(Laughter) FFL: Or, if you've never seen a toothbrush, confuse it with a baseball bat.

(Video) Computer: A man riding a horse down the street next to the building.

(laughter) FFL: We don't teach computers Art 101.

(Video) Computer: A zebra standing in a meadow.

FFL: And like you and me, we haven't learned to appreciate the amazing beauty of nature.

It was a long trip.

It was hard to raise children from 0 to 3 years old.

The real challenge is going from 3 to 13 and beyond.

Let me remind you again with this picture of the boy and the cake.

So far, we've taught computers to see objects and even tell simple stories when they see images.

(Video) Computer: A person sitting at a table with a cake.

FFL: But there's more to this picture than just people and cake.

What the computer doesn't know is that this is a special Italian cake that is only served around Easter time.

A boy is wearing his favorite T-shirt that his father gave him after a trip to Sydney. Both you and I can see how happy he is and what he is thinking at that moment.

This is my son Leo.

In my quest for visual intelligence, I am constantly thinking about Leo and the future world he will live in.

Machine vision gives doctors and nurses more tireless eyes to help them diagnose and care for their patients.

Cars will be able to drive smarter and safer on the road.

Robots as well as humans can help us brave disaster areas and rescue trapped and injured people.

We discover new species and better materials, and explore uncharted frontiers with the help of machines.

Little by little I started to see machines.

First, we teach them to see.

And they help us look better.

For the first time, the human eye will not be the only way to think about and explore our world.

We will not only harness machines for their intelligence, but we will work with them in ways we cannot even imagine.

This is my quest. Giving computers visual intelligence to create a better future for Leos and the world.

thank you.

(applause)

"Where are you from?" said the pale, tattooed man.

"where did you come from?"

September 21, 2001, ten days after the worst US attack since World War II.

Everyone is wondering about the next plane.

People are looking for scapegoats.

The president had vowed the night before to "judge the enemy or bring the enemy to justice."

And Bangladeshi immigrants work the cash registers at Dallas minimarts, surrounded by tire shops and strip joints.

Back home, Raisdin Buiyan was a big man and an Air Force officer.

But he dreamed of a fresh start in America.

If I had to work at a minimart for a short time to save up for IT, that would be fine because I have classes and his wedding in two months.

Then, on September 21st, the tattooed man enters the mart.

he has a shotgun

Raisdin knows the drill well and puts the cash on the counter.

This time the man did not touch the money.

"Where are you from?" he asks.

"Excuse me?" Raisdin replies.

His accent betrays him.

The Tattooed Man, a self-proclaimed authentic American vigilante, shoots Raisdin dead in revenge for 9/11.

Raisuddin felt millions of bees stinging his face.

In fact, dozens of scorching birdshot bullets were lodged in his head.

Behind the counter he lay covered in blood.

He puts his hand to his forehead and keeps the memory of betting everything on his mind.

He recites verses from the Quran and begs God to let him live.

he feels he is dying.

he didn't die

His right eye has turned away from him.

His fiancé left him.

His landlord, a mini-mart owner, kicked him out.

He was soon homeless and had $60,000 in medical debt, including the cost of calling an ambulance.

But Raisdin was alive.

And years later, he asked God what he could do to return the favor and be worthy of this second chance.

In fact, he came to believe that this chance needed to be given a second chance to a man who was supposedly not worth the chance at all.

Twelve years ago, I was a fresh graduate trying to find my way in the world.

Born in Ohio to Indian immigrants, I decided to do the ultimate rebellion against my parents and immigrated to the country where my parents had worked so hard to escape.

I thought my stay in Mumbai would be 6 months, but it was extended to 6 years.

I became a writer and found myself in the middle of a magical story. Hope is awakening in much of the so-called Third World.

Six years ago, when I returned to America, I realized something. The American Dream was thriving, but only in India.

Not so much in America.

In fact, I found America split into two distinct societies: the Republic of Dreams and the Republic of Terror.

And I stumbled across an incredible story about two lives and two Americas that brutally collided in a Dallas minimart.

I immediately wanted to learn more and eventually decided to write a book about them. Because their story was about the fall of America and how to put it back together.

After being shot, Raisdin's life was anything but easy.

The day after admission, the hospital discharged him.

His right eye was blind.

he couldn't speak

Metal rained down on his face.

But he didn't have insurance, so they kicked him out.

His family in Bangladesh begged him to come back.

But he told them he had a dream he wanted to see.

He found a job in telemarketing and later became a waiter at Olive Garden. Because there's no better place to overcome your fear of white people than the Olive Garden.

(laughter) Now, as a devout Muslim, he refused alcohol and never touched it.

Then I learned that if I didn't sell it, my salary would be reduced.

So he reasoned, like an up-and-coming American realist, "Well, God wouldn't want me to starve, would he?"

And before long, within a few months, Raisdin was Olive Garden's most profitable alcohol distributor.

He found a man who taught him database administration.

He got a part-time IT. gig.

Eventually, he landed a six-figure-earning job at a blue chip technology company in Dallas.

But when America started working for Raisdin, he avoided the classic mistake of the lucky man: assuming you were the rule rather than the exception.

In fact, he observed that many, like him, were trapped in second-chance lives, despite the good fortune of being born American.

He saw it in the Olive Garden itself. Many of my colleagues there told frightening stories of their childhoods, including family dysfunction, turmoil, addiction, and crime.

He had heard similar stories about a man who shot himself back while attending a trial.

As Raisdin drew nearer to the America he longed for from afar, he realized that, just as real, there was another America stingy for second chances.

The man who shot Raisdin grew up in that stingy America.

From afar, Marc Stroman was always a party sparker and always made the girls feel pretty.

Even if he was on drugs, even if he had a fight the night before, he was always working.

But he was always fighting demons.

He entered the world through the three gateways that doom many young Americans: bad parents, bad schools, and bad prisons.

Unfortunately, his mother told him as a young boy that they could not have an abortion for $50 more.

Sometimes the boy was at school and suddenly pointed a knife at his classmate.

Sometimes the same little boy would come to his grandparents and gently feed the horses.

Before he could shave, he was arrested and put first as a juvenile and then in prison.

He became a casual white supremacist and, like many around him, a drug addict and absentee father.

And not long after, he was put on death row for shooting not one, but three minimart clerks in a 2001 anti-jihad campaign.

Only Raisdin survived.

Oddly enough, the first facility to save Strowman was a death row inmate.

He quit under old influences.

The people involved in his life were virtuous and compassionate, including pastors, journalists, and European pen pals.

They listened to him, prayed with him, and helped him ask himself questions.

And sent him on a journey of self-reflection and improvement.

He finally faced the hatred that defined his life.

He read Holocaust survivor Viktor Frankl and regretted his swastika tattoo.

he found God

Then, one day in 2011, ten years after the crime, Stroman received a piece of news.

One of the men he shot, a survivor, was fighting to save his life.

In late 2009, eight years after the shooting, Raisdin embarked on a unique pilgrimage to Mecca.

In the crowd, he felt immense gratitude, but he also felt an obligation.

He recalled making a deathbed promise to God in 2001 that if he lived, he would serve humanity for the rest of his life.

Then he got busy relaying the bricks of life.

Now it's time to pay off his debt.

And after much deliberation, he decided that his method of payment would intervene in the chain of revenge between the Muslim and Western worlds.

And how will he intervene?

By publicly pardoning Stroman in the name of Islam and its doctrines of mercy.

And like most people shot in the face, he sued the state of Texas and Governor Rick Perry to block Strowman's execution.

(laughter) But Raisuddin's mercy was not inspired solely by faith.

As a new American citizen, he came to believe that Strowman was a product of America's bruises, more than just lethal injections.

That insight motivated me to write a book called The True American.

The immigrant is begging America to show the same kindness to his native son as he did to his adoption.

In a minimart many years ago, not just two men but two Americans clashed.

An America that still dreams, strives, and still imagines that tomorrow can build on today, and an America that surrenders to fate, succumbs to stress and confusion, lowers expectations, and hides in its oldest refuge: its own narrow kind of tribal fellowship.

And Raisdin, who was a newcomer, attacked, homeless and traumatized, yet belonged to that dream republic, and Strowman, who, despite being born with full-blown white privilege, belonged to that other broken nation.

I found the story of these men to be an urgent allegory about America.

This country, which I can proudly call my own, had not experienced a general decline like Spain or Greece, where the prospects were bleak for everyone.

America is both the most successful and least successful country in the industrialized world.

We're building the best companies in the world, even though record numbers of children are starving.

Even as the world's best hospitals are polished, we see life expectancy drop for large groups.

America today is a healthy, young body that has suffered one bout that sucks the life out of one, leaving the other worryingly perfect.

On July 20, 2011, shortly after a sobbing Raisdin testified in defense of Stroman's life, Stroman was murdered by lethal injection by the state he loved.

A few hours earlier, when Mr. Raisdin still thought he could save Strowman, the two had conversed for the second time in their lives.

Below is an excerpt from their call.

Raisdin: "Mark, know that I am praying for the Most Merciful and Merciful God.

I forgive you and I don't hate you.

I never hated you ”

Strowman: "You are a wonderful person.

Sincerely thank.

I love you, brother. ”

Even more shocking, Raisdin contacted Stroman's eldest daughter, Amber, an ex-convict and drug addict, after the execution.

and offered to help.

“You may have lost your father, but now you have an uncle,” he told her.

He wanted to give her a second chance as well.

If human history were a parade, America's float would be the neon temple of second chances.

But while America has generously given second chances to other nations' children, today it is miserable by denying its own children first chances.

America still allows anyone to become an American.

But it's losing its luster in allowing all Americans to be something.

Over the past decade, seven million foreigners have obtained US citizenship.

Remarkable.

How many Americans achieved middle-class status in that time?

In fact, net inflows were negative.

Going back further, it's even more amazing. Since the 1960s, the middle class has shrunk by 20%. This is largely due to people falling out of the middle class.

And as I've traveled across the country, I've found that the problem is much deeper than simple inequality.

What I observe is a pair of departures from the unifying center of American life.

The wealthy move up and up and away from enclaves of the educated elite and the global matrix of jobs, money and connections, and the poor move down into a disconnected dead end life that the fortunate rarely see.

And don't console yourself that you're 99 percent.

If you live near a Whole Foods store, if no one in your family is in the military, if you're paid by the year instead of by the hour, if most of the people you know are college graduates, if nobody you know uses methamphetamine, if you were married and are still married, if you're not one of the 65 million Americans with a criminal record, if any or all of these apply to you, then you don't really know what's going on and you're part of the problem. Please accept the possibility.

Other generations had to build a new society through slavery, survive the depression, defeat fascism, and find freedom in Mississippi.

I believe the moral challenge of my generation is to rediscover these two Americas and again choose union over separation.

This is not an issue that can be taxed or reduced.

Tweeting harder, building a smarter app, or starting another artisanal coffee roasting service won't solve this problem.

It is a moral challenge that implores each of us in prosperous America to take a declining America as our own, as Raisdin has attempted.

Like him, we too can make a pilgrimage.

And there, in Baltimore, Oregon, and Appalachia, he finds a new purpose just like he did.

We can immerse ourselves in the country, witness its hopes and sorrows, and, like Raisdin, ask what we can do.

What can you do?

What can you do?

what can we do

How can we build a more compassionate nation?

As the world's greatest inventors, we can invent solutions to America's problems, not just our own.

We writers and journalists can cover America's story instead of shutting down bureaus in the heart of America.

We can fund American ideas, not New York or San Francisco ideas.

We put our stethoscope on its back, we teach there, we go to court there, we live there, we pray there.

I believe this is the mission of the generation.

An America where two halves learn again to walk together, to cultivate, to discipline, and to dare.

A reorganized and renewed Republic of Opportunity begins with us.

thank you.

(applause)

♫ Gilles Sobule: At a conference in Monterey by the big, big jellyfish tank ♫ ♫ When I first saw you, I was so embarrassed. ♫ ♫ See, I might have been high, so I was a little paranoid. ♫ ♫ And I haven't done that in years, and I don't do it anymore. ♫ ♫ But that's another story. ♫ ♫ I love you forever and I'm a big fan. ♫ ♫ At the one-woman show, I also rented "Pat". ♫ ♫ I was brave enough to approach you, ♫ ♫ Little did I know that a year later we would be doing this show. ♫ ♫ Sing. Julia Sweeney: I tell stories. Together: The Jill and Julia Show. ♫ ♫ Sobule: Sometimes it works. Sweeney: Sometimes it doesn't. ♫ ♫ Together: The Jill and Julia Show. ♫ ♫ Sweeney: At a conference in Monterey, next to a big, big jellyfish tank ♫ ♫ When I first met you, you weren't so shy. ♫ I lined up for you and have been a huge fan ever since I was writing the pilot for Fox, Wendy and I wanted you to sing the theme song.

Then the pilot left, and I was very sad, but I remained a fan of yours.

And when I had a big, horrific breakup with Karl and couldn't get off the couch, I listened to your song, ♫Now That I Don't Have You,♫ over and over and over again.

And I can't believe you're here and meeting me here at TED.

Also, I can't believe eating sushi in front of a fish tank, which I personally think is really inappropriate.

(Laughter) (Applause) And little did I know that a year later we would be doing this show. ♫ ♫ Sobule: I sing. Sweeney: I tell stories. Together: The Jill and Julia Show. ♫ Sobule: Hey, they asked us back! Sweeney: Can you stand it?!

♫ TOGETHER: Jill and Julia, Jill and Julia, Jill and Julia Show. ♫ ♫ Sobule: Why are all our heroes so imperfect? ​​♫ ♫ Why do they always bring me down? ♫ ♫ Why are all our heroes so imperfect? ​​♫ ♫ The statue in the park has lost its crown. ♫ ♫ William Faulkner was drunk and depressed. ♫ Sweeney: Hmm.

♫ Dorothy Parker, mean, drunk and depressed. ♫ Sweeney: I know.

♫ And it turns out that "Seven Years in Tibet" was Nazi. ♫ Sweeney: Yes.

♫ The founding fathers all had slaves. ♫ Sweeney: I know.

♫ The explorers slaughtered the brave. ♫ Sweeney: It sucks.

♫ Sobule: The God of the Old Testament is very boring. ♫ Sweeney: Don't let that get you started. (laughs) ♫ Sobule: Paul McCartney, I'm jealous of John, even more so now that he's gone. ♫ ♫ Dylan was very mean to Donovan in that movie. ♫ ♫ Pablo Picasso was cruel to his wives. ♫ Sweeney: It sucks.

♫ Sauveur: My favorite poets have taken their own lives. ♫ ♫ Orson Welles peaked at age 25 and was right in front of us. ♫ ♫ And he sold bad wine. ♫ ♫ TOGETHER: Why are all our heroes so imperfect? ♫ Sweeney: Oh.

♫ Lewis Carroll Certainly so was Alice. ♫ Sweeney: What?

♫ Plato is in a cave with some very young boys. ♫ Sweeney: Oh...

♫ Sobule: Hillary supported the war. ♫ ♫ Sweeney: Even Thomas Friedman supported the war. ♫ (laughter) ♫ Sobule: Colin Powell was... with: ... such a pussy. ♫ (Laughter) (Applause) ♫ Sobule: William Faulkner, drunk and depressed. ♫ ♫ Tennessee Williams, drunk and depressed. ♫ Sweeney: Yes.

♫ Sobule: Okay, Julia. ♫ Sweeney: Okay. Oprah wasn't always a big hero to me.

I mean, most of the time I see Oprah when I'm in Spokane visiting my mom. And to my mother, Oprah has more moral authority than the Pope, who actually has something to say because she's a devout Catholic.

Anyway, I like Oprah. I like her girlfriend look. I like her weight problem. I love how she transformed talk TV. I love how she brought reading back to America. But something happened in the last two weeks. It's... I call it the Soon-Yi moment. That's the moment when you can't continue to support someone.

And it was she who did two full shows promoting the movie, The Secret.

Do you know the movie "The Secret"?

This makes "What the Bleep Do We Know" look like a Harvard PhD dissertation on quantum mechanics, which is pretty bad.

"The Da Vinci Code" looks like "War and Peace".

That movie is so bad. It promotes such horrific pseudoscience.

The basic idea is that there is a Law of Attraction and your thoughts have vibrational energies that permeate the Universe and attract good things to happen to you.

Based on scientific evidence, it's not just the "power of positive thinking", it has a scary dark side to it. For example, we get sick because we think only negative thoughts.

Oh, that sort of thing is in the movies and she was promoting it.

And I just want Murray Gell-Mann to take Oprah and explain to her that the Law of Attraction isn't really a law.

That's what I have to say.

(laughter) (applause) ♫ Sobule: I sing. Sweeney: I tell stories. Together: The Jill and Julia Show. ♫ ♫ Sobule: Sometimes it works. Sweeney: Sometimes it doesn't. ♫ ♫ Together: Jill and Julia, Jill and Julia, Jill and Julia Show. ♫ (applause)

I'm a potter, which seems like a pretty humble profession.

I know a lot about pot.

It took about 15 years to make.

One of the things that really excites me about my artistic practice and training as a potter is that I can quickly learn how to make something great out of nothing. Spending a lot of time running wheels on piles of clay and trying things out. And that my abilities, the limits of my abilities, are based on my hands and my imagination. That if you want to make a really nice bowl and you don't know how to make the legs yet, you'll have to learn how to make the legs. I have found that learning process to be very useful in my life.

As a potter, I feel like I'm starting to learn how to shape the world as well.

Sometimes, within my artistic capacity, I wanted to look back at other really important moments in American history and in world history where hard things happened, but how do you talk about tough ideas without cutting people off from the content?

Can you use art like an old defunct firehose from Alabama to speak to the complexity of the 60s civil rights moment?

Can I talk about my father and I working on a labor project?

My father was a roofer, a builder and ran a small business, but at 80 he was ready for retirement and his tar kettle was my inheritance.

Now, the tar kettle doesn't seem very heritage. It wasn't.

It stinks and takes up a lot of space in the studio, but I asked my dad if he could reimagine this kind of nothingness material as something special, and if he could make some art with me.

And will improving that material and my father's technique help me start thinking about tar in new ways, just like clay, making different shapes and imagining what's possible?

After making clay, I became interested in different types of materials and my studio grew a lot. This is because I thought that what was important was not the material, but the ability to shape things.

I became more and more interested in ideas and what was happening outside the studio.

To give you a little context, I live in Chicago.

I live on the Southside now. I'm a west sider.

It means nothing to non-Chicago people, but there would have been a lot of people in the city who were very upset if I hadn't mentioned that I was a West Sider.

The area where I live is Grand Crossing.

It is an area that has seen better times.

It is by no means a gated community.

There was a lot of abandoned stuff in my neighborhood, and while I was busy making pots, making art, and building a good art career, all this stuff was happening right outside my studio.

We all know about the housing market failure and the epidemic challenge, and I feel like we talk about it more in some cities than in others, but I think the US and many other cities have the challenge of dead, abandoned buildings that people no longer know what to do with.

So I wondered if there was a way I could start thinking about these buildings as an extension or extension of my artistic practice.

And I thought that if we were thinking together with other creators, architects, engineers, real estate financiers, we might be able to think together about restructuring the city in a more complex way.

That's why I bought the building.

This building was really affordable.

we cheated on it.

I made it as beautiful as possible so that some activity happens in my block.

After purchasing the building for about $18,000, there was no money left.

So I started cleaning the building as a kind of performance.

This is performance art, people came in and I started cleaning.

Brooms were free, and sweeping was free.

It worked.

(Laughter.) But we used the building to host exhibitions and small dinners. And it turned out that in a way, that building in the Dorchester neighborhood where I lived, which we now call that block the Dorchester Project, has become a kind of gathering place for different kinds of activities.

We transformed that building into what we now call the Archive House.

Archive House does all these amazing things.

Very important people inside and outside the city will find themselves in the middle of the hood.

And at that point, I had a feeling that maybe there was a connection between me and the history of clay and this new thing that was starting to develop, slowly beginning to reshape the way people imagined the South Side of the city.

I always tried to suggest that one house becomes several houses and that it is not only important to make beautiful vessels, but also what happens in the building is very important.

So we were thinking not only about development, but thinking about the program, thinking about any possible connections between houses, next door to another house.

The building has become what we call the "Listening House", a collection of discarded books from the Johnson Publishing Company and other books from defunct antiquarian bookstores.

I actually wanted to revitalize these buildings as much as possible with someone or something that would join me.

Chicago has an amazing building stock.

This building was once a crack house on the block, and it provided a great opportunity to really imagine what would happen when that building was abandoned.

So we transformed this space into what we call the Black Cinema House.

Black Cinema House was an opportunity to present films that were important and relevant to the people who lived around me. I figured if you wanted to show an old Melvin Van Peebles movie, you could.

If you want to show "Car Wash", you can show it.

That's amazing.

The building soon became too big and had to move to a larger space.

A black cinema house made from just a tiny piece of clay had to grow into a larger piece of clay and that is my studio now.

What I realized was that for the people doing the zoning, part of what I was doing with the building that was left was not the purpose for which it was built, but the city's policy that "a house that is residential needs to remain residential."

But what do you do in a neighborhood no one wants to live in?

Could it be that those who have the means to leave have already left?

What to do with these abandoned buildings?

So I was trying to use culture to awaken them.

We knew we had to look for a bigger building because it was so inspiring to people and people were responding so well to the work.

By the time we found the bigger buildings, we had partially the resources we needed to think about them.

This bank, as we called it, was in pretty bad shape.

There was about 6 feet of standing water.

The project was difficult to finance. Because people weren't interested in the area because nothing was going on there, so the banks weren't interested in the area either.

It was dirty. there was nothing. It was nowhere.

So we started imagining what else could happen in this building.

(Applause.) Well, word of my block started to spread, and people started coming in, but it turned out that the bank could be a hub for exhibitions, archives, and music performances, and that there were people interested in adjoining those buildings because we brought the heat and started a kind of fire.

One of the archives there is this Johnson Publishing Company.

We have also begun collecting memorabilia of American history from people who live or have lived in the area.

Some of these images are like degraded images of black people, and some of them are histories of very challenging content, but what better place to talk about the complexities of race and class than in a neighborhood full of young people constantly questioning their identities?

In a way, the bank represents a hub, and that we're going to create a very full-fledged node of cultural activity, and that if we could start building multiple hubs and connect cool green stuff around them, if we could connect these buildings with beautiful green belts that have about 60 or 70 buildings that we've purchased and rehabilitated now, and then land a miniature Versailles on top of that - (applause) - this place that people never wanted to go to would become an important destination. That. People from all over the country and around the world.

In a way, I feel like I am a potter. Working on what is behind your wheel and challenging yourself with the skills you have to think about the next bowl you want to make.

And it ranged from bowls to thinking about idiosyncratic homes, blocks, neighborhoods, cultural districts, and cities, and at every point there was something I had to learn that I didn't know.

I have never learned so much about zoning in my life.

I never thought I would have to.

But as a result, I realized that there is room not only for my own artistic practice, but for many others.

So people started asking us, "So, Theaster, how are you going to scale?"

And "What is your sustainability plan?"

(Laughter) (Applause) And what I've realized is that you can't export yourself, and what it seems to take in cities like Akron, Ohio, Detroit, Michigan, and Gary, Indiana, is that there are people in the place who already believe in the place and who are already desperate to make the place beautiful, and a lot of the time people who are passionate about the place are cut off from the resources they need to make great things happen, or make things happen. It means that you are cut off from the casual connections of people who might help you.

So now we're starting to offer advice across the country on how to start with what you have, how to start with what's in front of you, how to make something out of nothing, how to recreate the world on wheels, blocks and cities.

Thank you very much.

(Applause) June Cohen: Thank you. So I think a lot of people watching this will be asking themselves the last question you posed. How can we do this in our city?

You cannot export yourself.

Tell us a few pages from your playbook about what people inspired by their city can do to tackle projects like yours.

THEATER GATES: One of the things I've found really important is not just thinking about individual projects like the old house, but how are the relationships between the old house, the local school and the little bodega, and are there any synergies between them?

Could you please talk to those people?

We found that even when neighbor interaction failed, the pulse was still there in many cases.

How do you identify the vibrancy and passionate people of a place, and how do you reinvigorate people who have been fighting for 20 years about the place they live in?

So someone has to do the job.

If I were a traditional developer, I would just talk about the building and put a "For Rent" sign on the window.

In fact, I think we need to be more selective than that. I think you need to keep in mind what is the business you want to grow here.

And is there anyone who lives in this location and wants to grow that business with me?

Because I think that it is not just a cultural space or a house. We have to recreate the core of the economy.

So I think it's right to put those things together.

JC: It's hard to get people to rekindle the spark when they've been trying for 20 years.

Is there a method that helped you break through?

TG: Well, I think there are a lot of examples of people doing great work now, but those methods are kind of like, if the media is always saying that in a place there's nothing but violent things going on, what can you do in your neighborhood to combat that sort of thing, based on your skill set and your particular situation.

So, if you like theater, you know there's an open-air street theater festival.

Sometimes a particular neighborhood just doesn't have the resources to do some kind of flashy thing, but if we can find a way to bring together the locals of the place, and the people who support what's going on locally, I think really great things can happen.

JC: Very interesting.

And how can you be sure that the project you're making is actually for the underprivileged and not for the vegetarian indie movie crowd that comes to take advantage of it?

TG: That's right. I think this is where the deep weed begins.

JC: Let's go there. TG: Right now, 99% of Grand Crossing is black, or at least lives there. Perhaps we know that the people who own property in that location are different than the people who walk down the street every day.

So it's reasonable to say that Grand Crossing is already becoming different than it is today.

But is there a way to think about a housing trust or a land trust or a mission-based development that starts to protect a portion of the space that arises? If you have 7,500 vacant lots in your city, you want something to happen there, but you need an organization that is not only interested in the development part, but also interested in the stabilization part. I feel like the development part is often really motivated, but some kind of neighborhood consciousness other work, that part is no longer alive.

So how do we begin to raise vital guard dogs that ensure that the resources available to newcomers are also distributed to those who have lived in the area for a long time?

JC: It makes a lot of sense. I have one more question. You make a very compelling case for beauty and the importance of beauty and art.

Some would argue that the funds would be better spent on basic services for the underprivileged.

How do you counter or oppose such views?

TG: I think beauty is a basic service.

(Applause) If there are cities or regions that lack certain resources, or communities that have resources that are not available, sometimes culture can catch fire, and often I can't do everything, but I think there's a way that if you can start with culture and get people to reinvest in the place, other kinds of adjacent amenities will start to grow, and then people can make demands that are poetic demands, or political demands. It's just what we need to awaken our cities, and it's also very poetic.

JC: It makes perfect sense to me.

Teaster, thank you very much for being here today.

thank you. theater gates.

(applause)

People at home call me a jerk, a troublemaker, an annoyance, a rebel, an activist, a people's advocate, and so on.

But it wasn't always me.

Growing up, I had a nickname.

They called me "Softy," meaning a soft, harmless boy.

Like any human being, I stayed out of trouble.

As a child, they taught me silence.

Don't argue, just do what you're told.

In Sunday school we were taught not to confront, not to argue, to turn the other cheek even if you were right.

This was further reinforced by the political climate of the time.

(Laughter) Kenya is a guilty country until proven rich.

(Laughter) Kenya's poor are five times more likely to be shot dead by the police who are supposed to protect them than by criminals.

This was further reinforced by the political climate of the time.

There was a dictator named Moi.

He ruled the country with an iron fist, and anyone who dared to question his authority was arrested, tortured, imprisoned, and even killed.

That meant people were taught to be smart cowards and stay out of trouble.

Being a coward was not an insult.

Coward was a compliment.

We were told, "Cowards go home to their mothers."

It means that you can survive if you avoid trouble.

I was skeptical of this advice, but eight years ago there was an election in Kenya and the results were hotly contested.

What followed that election was terrible violence, rape and the murder of over 1,000 people.

My job was to document violence.

As a photographer I took thousands of pictures and two months later two politicians met, drank tea, signed a peace deal and the country moved forward.

I saw the violence firsthand and was very upset.

I saw the murder scene. I saw displacement.

I met women who were raped and it made me feel uneasy, but the country never spoke about it.

we pretended We have all become smart cowards.

We decided to stay out of trouble and not talk about it.

After 10 months I quit my job. I said I couldn't take it anymore.

After quitting my job, I decided to organize a group of friends to talk about domestic violence, about the state of affairs in the country. June 1, 2009 was the day we went to the stadium to get the president's attention.

Today is a public holiday, and on national television, I showed up at the stadium.

Friends did not show up.

I found myself alone and I didn't know what to do.

I was scared, but I knew very well that I had to make a decision that day.

Could I live as a coward like everyone else or was I going to stand up?

And when the president stood up to speak, I found myself standing up and shouting at him to remember the victims of post-election violence and stop corruption.

And suddenly, out of nowhere, the police attacked me like a hungry lion.

They grabbed my mouth, dragged me out of the stadium, beat me up there and put me in jail.

That night I spent on the cold cement floor of the prison made me think.

What made me feel that way?

Friends and family thought I was crazy because of my actions, and the images I took were disrupting my life.

The pictures I took were just numbers for many Kenyans.

Most Kenyans did not see the violence.

It was their story.

So I decided to actually start a street display to show images of violence across the country and get people talking about it.

We traveled around the country showing images, and this is the journey that led me to my activist path, and I have decided to stay silent and talk about these things.

We traveled, and a common site for street displays became for political graffiti on the state of the country, talking about corruption and bad leadership.

There have also been symbolic burials.

We delivered a live pig to Kenya's parliament as a symbol of politicians' greed.

This has been done in Uganda and elsewhere, and most powerfully, the images have been picked up by the media and magnified across the country and across the continent.

Seven years ago I stood alone, but now I belong to a community of many people who stand with me.

I am no longer alone when I stand up to talk about these things.

I belong to a group of young people who are passionate about this country and want to make a difference. They are no longer fearful and wise cowards.

That was my story.

That day at the stadium I stood up as a smart coward.

With that one word, I said goodbye to 24 years of being a coward.

There are two most powerful days in life. The day I was born and the day I discovered why.

Standing in the stadium that day, screaming at the president, I knew why I was truly born and that I could no longer remain silent in the face of injustice.

do you know why you were born

thank you.

(Applause) Tom Riley: Great story.

I would like to ask you a few simple questions.

PAWA254 has created a studio, or place, where young people can harness the power of digital media to carry out such activities.

What's going on with PAWA now?

Bonifas Mwangi: So we have a community of filmmakers, graffiti artists and musicians who come together to brainstorm and work on problems when there is a problem in the country.

Art is our most powerful tool. Because we live in a very busy world and people are so busy with life that they don't have time to read books.

Therefore, we package our activities, we package our messages into art.

So music, graffiti, art, that's what we do.

Can I say one more thing?

TR: Yes, of course. (Applause) BM: Despite being arrested, beaten and threatened, the moment I discovered my voice, the moment I felt I could actually stand up for what I truly believed in, I was no longer afraid.

I used to be told I was soft, but now I'm not. Because I discovered my true self. I mean, that's what I want to do, and there's something very beautiful about doing it.

There is nothing more powerful than knowing that I am destined to do this. Because you don't get scared, you just keep living your life.

thank you.

(applause)

Tonight, I would argue that inviting a loved one, a friend, or even a stranger to record a meaningful interview with you could be one of the most important moments in their life and in your life.

At the age of 22, I was lucky enough to find my calling in radio storytelling.

Around the same time, I found out that my father, with whom I was very close, was gay.

I was completely amazed.

I was devastated because we were such a close-knit family.

At one point, during our tense conversation, my father mentioned the Stonewall riots.

He told me how one night in 1969 at a gay bar called the Stonewall Inn in Manhattan, a group of young black and Latino drag queens fought back with the police and how this sparked the modern gay rights movement.

It was a great story and it piqued my interest.

So I picked up a tape recorder and decided to take a closer look.

With the help of a young archivist named Michael Scherker, we tracked down all the people who were at the Stonewall Inn that night.

As I was recording these interviews, I realized that the microphone had given me permission to go places I would never have otherwise gone and speak to people I would never have otherwise spoken to.

I have had the opportunity to meet some of the most amazing, fierce and brave people I have ever met.

This was the first time the story of Stonewall was told to a national audience.

I dedicated this program to my father. It changed my relationship with my father and changed my life.

Over the next 15 years, I made more radio documentaries and worked to shed light on people who are often underrepresented in the media.

Time and time again I have seen how this simple act of being interviewed can mean so much to people, especially those who have been told their stories don't matter.

I could literally see my spine straighten as people started speaking into the microphone.

In 1998, I made a documentary about the last luxury hotel on Manhattan's Bowery.

The men stayed in these cheap hotels for decades.

They lived in private cells the size of prison cells covered in wire mesh, so they couldn't jump from one room to the next.

Then I wrote a book about men with photographer Harvey Wang.

I remember walking into a mass store with an early version of the book and showing one of the guys my pages.

He stood there staring at it in silence, then grabbed the book out of my hand, held it over his head, and began running down a long corridor, shouting, "I exist, I exist."

(Applause.) In many ways, "I exist" became StoryCorps' clear calling. This is this crazy idea that I came up with a dozen years ago.

The idea was to take the documentary and turn it upside down.

Traditionally, a broadcast documentary is about recording interviews to create a work of art, entertainment or education for a large number of people to see and hear, but I wanted to try something that the interview itself was the purpose of this work and see if this method could provide an opportunity for a large number of people to hear it.

So, 11 years ago, we created a booth in Grand Central Terminal where anyone could honor someone by interviewing them about their life.

When you come to this booth, the facilitator will take you inside.

For example, sit across from your grandfather for nearly an hour and listen and talk.

Many people wonder, if this were our last conversation, what would I want to ask or say to this person who is so dear to me?

At the end of the session, you take a copy of the interview home and another copy is sent to the American Folklife Center at the Library of Congress. Then your great-grandchildren, great-grandchildren, great-grandchildren will one day know him through his voice and stories.

So we open this booth in one of the busiest places in the world and invite people to have this incredibly intimate conversation with another human being.

I wasn't sure if it would work, but it worked from the start.

People treated the experience with incredible respect, and great conversations ensued.

I would like to play only one animation excerpt from the interview recorded at the original Grand Central booth.

Here is 12-year-old Joshua Littman interviewing his mother Sarah.

Josh has Asperger Syndrome.

As you may know, children with Asperger Syndrome are very intelligent, but they have social challenges.

They usually have an obsession.

In Josh's case, it's because of the animals, and this is Josh talking to his mother, Sarah, in Grand Central nine years ago.

(Video) Josh Littman: On a scale of 1 to 10, would your life be different without animals?

Sarah Littman: I'd say 8 if it wasn't for the animals. Because animals bring so much joy to life.

JL: How would your life be different without them?

SL: It doesn't have to be anything like cockroaches or snakes.

JL: Well, as long as the snake isn't venomous or constricting, it's fine.

SL: Well, I don't like big snakes -- JL: But cockroaches are exactly the insects we hate.

SL: Yes, really.

JL: Have you ever felt that having children was unbearable?

SL: When you were a baby, I remember crying all the time because you cried so much at night.

JL: What is colic? SL: When my stomach hurts and I just keep screaming for like four hours.

JL: Are you louder than Amy?

SL: You were pretty loud, but Amy's was much higher.

JL: I feel like people are liking Amy more. She seems like the perfect little angel.

SL: Well, I can understand why you think people like Amy more. I'm not saying it's because of your Asperger Syndrome, but I know it's easy for Amy to be friendly, but hard for you, but the people who take the time to get to know you love you so much.

JL: Ben or Eric or Carlos? SL: Well -- JL: You mean I have quality friends, but not a lot of them? (Laughter) SL: I don't judge quality, but I think -- JL: So first Amy loves Claudia, then hates Claudia, loves Claudia, then hates Claudia.

SL: It's also about girls, honey.

The important thing for you is that you have a few very close friends. That's what life really needs.

JL: Was I the son you wanted when you were born?

Did I meet your expectations?

SL: You've exceeded my expectations, sweetie, because I'm sure you have fantasies about what your child will be like, but you've made me a great parent because that's what you think -- JL: Well, I made you a parent.

SL: You made me a parent. That's a good point. (Laughter) But you think differently than you're taught in parenting books, so I had to learn to think outside the box with you. It made me more creative as a parent and as a person. I am always grateful for that.

JL: So when Amy was born, did it help?

SL: It helped when Amy was born, but you are incredibly special to me and I am so lucky to have you as my son.

(Applause.) DAVID ISEY: After this article aired on public radio, Josh received hundreds of letters telling him what a great kid he had been.

Their mother, Sarah, bound them in a book, and when Josh was bullied at school, they read the letter together.

I want to admit that there are two of my heroes here tonight.

Sarah Littman and her son, Josh, are currently honors students in college.

(Applause.) You know, a lot of people cried when they heard StoryCorps, but it wasn't because they were sad.

Most do not.

I think it's because I'm listening to something real and pure in this moment when it's hard to tell what's real and what's advertising.

It's a kind of anti-reality television.

No one comes to StoryCorps to get rich.

No one is here to be famous.

It is simply an act of generosity and love.

Many of them are ordinary people who talk about lives lived with kindness, courage, civility and dignity, and sometimes it feels like walking on holy ground.

So this experiment in Grand Central paid off, and we expanded our business across the United States.

Today, over 100,000 people in thousands of cities and towns in 50 states are recording StoryCorps interviews.

It has become the largest single collection of human voices ever collected.

(Applause.) We've hired and trained hundreds of facilitators to guide people through their experiences.

Most work as StoryCorps for a year or two, traveling across the land to gather the wisdom of humanity.

They call this "witness testimony," but if you ask, all the facilitators will tell you that the most important thing they learned from being in this interview is that people are basically good.

And while you could argue that there was some sort of selection bias in the first few years of StoryCorps, after tens of thousands of interviews with all kinds of people in every part of the country, rich and poor, ages 5 to 105, speaking 80 different languages, across political spheres, I'm forced to wonder if maybe these people actually know something.

I also learned a lot from these interviews.

I have learned about the poetry, the wisdom and the grace that can be found in the words of those around me just by taking the time to listen. For example, in an interview in which a Brooklyn gambling clerk named Danny Perasa took his wife Annie to StoryCorpse to talk about his love for her.

(Audio) Danny Pelasa: You see, the truth is, I always feel guilty when I say "I love you" to you.

And I say it often. I say this to remind you that it comes from me, just as stupid a person I am.

It's like hearing a beautiful song from an old broken radio. It is a kind thing to keep the radio in the house.

Annie Perasa: If there's no note on the kitchen table, something's wrong.

You write me love letters every morning.

DP: Well, the only thing that could possibly be wrong is that I couldn't find a stupid pen.

AP: Dear Princess: The weather outside today is very rainy.

I will call you at 11:20 in the morning.

DP: That's a romantic weather forecast.

AP: And I love you. I love you. I love you.

DP: When a man is happily married, he knows that no matter what happens at work, no matter what happens for the rest of the day, he'll have shelter when he gets home and it's okay to hug someone instead of being pushed downstairs and being told to "let go."

Getting married is like having a color TV.

I never want to go back to a black and white situation.

(Laughter) DI: Danny was about five feet tall, cross-eyed and had a single entwined tooth, but Danny Perasa's little pinkie had more romance than all of Hollywood's leading men combined.

What else have we learned?

I learned about the unimaginable capacity for forgiveness of the human spirit.

I learned about resilience, I learned about strength.

It's like an interview with O'Shea Israel and Mary Johnson.

When O'Shea was a teenager, a gang feud killed Mary's only son, Laramian Byrd.

A decade later, Mary went to prison to meet O'Shea and find out who had taken her son's life.

Slowly and surprisingly, they became friends, and O'Shea actually moved in next door to Mary when he was finally released from prison.

Here are just a few of the conversations they had shortly after O'Shea was released.

(Video) Mary Johnson: My biological son is no longer here.

I didn't see him graduate, but you are in college now.

You will have the opportunity to see them graduate.

I didn't see him get married.

I hope someday I can experience it with you.

O'SHARE ISRAEL: My only motivation is to hear you say such things and to join my life as you do.

It motivates me to make sure I'm on the right track.

You still believe in me, and the fact that you can do it despite all the pain I have caused you is amazing.

MJ: As we sit here now, staring at each other, we know it's not easy to share stories together.

I know it's not easy, so I admire that it can be done.

OI: I love you, young lady. MJ: I love you too, son.

(Applause) DI: And I've been reminded countless times of the courage and goodness of people and how the arc of history truly bends toward justice.

Like the story of Alexis Martinez, born Arthur Martinez in a Harold Ikes project in Chicago.

In an interview, she spoke with her daughter, Leslie, about joining a gang at a young age and turning into the woman she was supposed to be later in life.

This is Alexis and her daughter Leslie.

(Audio) Alexis Martinez: One of the most difficult things for me was the constant fear that I wouldn't be allowed to be a part of my granddaughters' lives, but you and your husband, you totally blew that.

One of the results is that my granddaughters sometimes fight over whether I am him or my granddaughter in my relationship with them.

Leslie Martinez: But they talk about it freely.

AM: They talk about it freely, but for me it's a miracle.

LM: No need to apologize. No need to tiptoe.

We are not going to cut you off and that is what I always wanted you to know, you are loved.

AM: You know, I live like this every day now.

I walk the streets as a woman and I feel really at peace with who I am.

I mean, maybe I wish I had a softer voice, but now I'm walking in love and trying to live like that every day.

DI: Now I'm walking in love.

Let me tell you a secret about StoryCorps.

It takes a little courage to have a conversation like this.

StoryCorps speaks to our mortality.

Participants know that this recording will be heard long after they leave.

We had a hospice doctor named Ira Bjok who worked closely with us to record interviews with dying people.

He wrote a book called "The Four Things That Matter Most" about four things he would say to the most important people in his life or before he died. It's "thank you, i love you, forgive me, forgive me".

Those are the most powerful words we can say to each other, and they often happen at the StoryCorps booth.

It's an opportunity to get closer to the people you care about. No regrets, no regrets.

It's hard and takes courage, but that's why we're alive, right?

Now, the TED Awards.

When I first heard about this potential award from TED and Chris a few months ago, I was completely blown away.

They asked me to come up with a very short wish for humanity in 50 words or less.

So I thought about it and wrote 50 words. A few weeks later, Chris called me and said, "Good luck."

So my hope is that through StoryCorps, we can share with the world all that we have learned so that anyone, anywhere can easily record meaningful interviews with other humans and archive them as history.

How do we do that? with this.

We are rapidly moving into a future where everyone in the world has access to one of these, and this has powers that were unimaginable 11 years ago when I started StoryCorps.

It has a microphone that allows you to give instructions on how to operate it and send audio files.

These are the key ingredients.

So the first part of the wish has already started.

Over the past few months, the StoryCorps team has been hard at work creating an app that takes StoryCorps out of the booth so that anyone can experience it anywhere, anytime.

Remember. StoryCorps are always two-person, with a facilitator helping record conversations that are preserved forever. But at this very moment, we are releasing a public beta of the StoryCorps app.

This app is a digital facilitator that guides you through the StoryCorps interview process, helps you choose questions, gives you all the tips you need to record a meaningful StoryCorps interview, and uploads it to the Library of Congress archives with one tap.

That's the easy part, the technology.

The real challenge is up to you. By taking this tool and figuring out how it can be used across America and around the world, instead of recording thousands of StoryCorps interviews per year, we could potentially record tens of thousands, hundreds of thousands, or more.

For example, imagine a national homework assignment for all high school students studying American history across the country to record an interview with their elders on Thanksgiving. This means that in one weekend, the lives and experiences of an entire generation of Americans will be chronicled.

(Applause.) Or imagine mothers somewhere in the world on opposite sides of a conflict sitting down to find out who they are as humans instead of talking about it, and in doing so begin to build a bond of trust. Or maybe one day it will become a tradition around the world to have a StoryCorps interview honored on your 75th birthday. Or let people in your community take the app to enter nursing homes, hospitals, homeless shelters and even prisons, honoring the most voiceless people in our society and asking them who they are, what they've learned in life, and how they want to be remembered.

(Applause.) Ten years ago, I taped a StoryCorps interview with my father, a psychiatrist who became a prominent gay activist.

This is a photo from that interview.

I never thought about recording it until a few years ago when my father, who seemed to be in perfect health and seeing his patients 40 hours a week, was diagnosed with cancer.

He died suddenly a few days later.

June 28, 2012 was the anniversary of the Stonewall riots.

I first heard the interview at 3:00 am the day he died.

I have some young children at home, and I knew that the only way they would get to know this very important person in my life was through the sessions.

I thought I couldn't believe StoryCorps any deeper, but in this moment I fully and intuitively understood the importance of making these recordings.

Every day, people come to me and say, 'I wish I had interviewed my father or my grandmother or my brother, but I waited too long.

Now no one has to wait anymore.

Join us in creating a digital archive of lasting, important conversations at a time when so many of our ways of communicating have become ephemeral and insignificant.

Help us create for our children this gift of who we are as humans.

We would appreciate your cooperation in fulfilling this wish.

Interview family members, friends and even strangers.

Together, we can create an archive of human wisdom, and perhaps in doing so, we will learn to listen a little more and shout a little more.

Perhaps these conversations remind us of what really matters.

And perhaps, perhaps, it helps us recognize the simple truth that all lives, all lives, are of equal and infinite importance.

thank you very much.

(Applause.) Thank you. thank you.

(Applause.) Thank you.

(applause)

When I wrote my memoir, the publishers were really confused.

Was it about me as the child of refugees, or about me as the woman who founded a high-tech software company in the 1960s that went public and eventually employed more than 8,500 people?

Or as a mother of a child with autism?

Or as a philanthropist who donates a lot of money?

Well, I am all of this, after all.

Now let me tell you my story.

My everything stems from a train ride in Vienna as part of Kindertransport, which saved about 10,000 Jewish children from Nazi Europe.

As a five-year-old, I was clutching my nine-year-old sister's hand and had little idea what was going on.

"What is England and why are you going there?"

I am alive because a long time ago, strangers helped me.

I was lucky and doubly lucky to be reunited with my birth parents later.

But sadly I never bonded with them again.

But in the 70 years since that miserable day when my mother put me on the train, I have done more than I could have ever imagined.

And I love my second home, England, with a passion that perhaps only a disenfranchised person can feel.

I decided to make my life worth saving.

And I kept doing it.

(Laughter) Let's go back to the early 1960s.

To overcome the gender issues of the time, I founded my own software house with one of the first such start-ups in the UK.

But it was also a women's company, a company for women, and an early social business.

At the time, software was distributed for free along with the hardware, so people laughed at the very idea.

No one will buy software, and certainly not from women.

Back then, women were graduating from college with decent degrees, but there was a glass ceiling to our progress.

I hit the glass ceiling so many times that I wanted women to have a chance too.

I hired women with professional qualifications who quit the industry after getting married or having their first child, and organized a work-from-home organization.

We pioneered the concept of women returning to work after a career break.

We pioneered all sorts of new and flexible ways of working: work sharing, profit sharing, and ultimately co-ownership that put a quarter of the company in the hands of our staff at no cost to anyone but me.

For many years I was the first or only woman like this.

At that time, I couldn't work on the stock exchange, drive a bus, or fly an airplane.

Indeed, I could not have opened a bank account without my husband's permission.

Women of my generation fought for the right to work and equal pay.

At the time, expectations were all about home and family responsibilities, so no one expected much from people at work or in society.

And I couldn't really face it, so I started challenging the conventions of the time, to the point of changing my name from "Stephanie" to "Steve" in business development letters so I could walk through the door before anyone knew I was a woman.

(Laughter) My company, called Freelance Programmers, did exactly that, but at the dining room table, with funding equivalent to $100 in today's terms, funded by my labor and house debt, I couldn't start smaller.

My interest was scientific and the market was commercial, such as payroll, which I found rather boring.

So I had to compromise on my operational research job. The work had an intellectual challenge that interested me and a commercial value that the client appreciated. Examples include freight train scheduling, bus timetables, inventory management, and bulk inventory management.

And finally I got a job.

We disguised the domestic worker and part-time nature of our staff by offering a fixed price. This was one of the first attempts.

And who would have guessed that programming the Supersonic Concord black box flight recorder was done by a bunch of women working from home?

(Applause.) All we used was a simple approach of “trust your staff” and a simple phone call.

We even asked job seekers, "Can I use the phone?"

An early project was to develop a software standard for management control protocols.

And since software was and still is a very difficult activity to control, this was very valuable.

We used that standard ourselves, and over the years we were also paid to update that standard, which was eventually adopted by NATO.

Please remember that our programmers only have women, including gays and transgenders. Using pencil and paper, I created a flow chart defining each task to be performed.

Then you create code (usually machine code, sometimes binary code), send it by mail to a data center, punch it onto a paper tape or card, punch it again, and validate it.

All of this was done before we even got near the computer.

That was programming in the early 1960s.

In 1975, 13 years after its founding, the Equal Opportunity Act came into force in the UK, making pro-women policies illegal.

And as an example of the unintended consequences, my women's company had to recruit men.

(Laughter) When I started a women's company, the men said, 'That's interesting, because it works because it's small.'

And then when it got pretty big, they accepted, 'Yes, it's pretty big now, but it doesn't benefit you strategically.'

Then when that company was valued at over $3 billion and I turned 70 employees into millionaires, they kind of said, "Well done, Steve!"

(Laughter) (Applause) You can tell an ambitious woman by the shape of her head. They have a flattened crown from being patronized and stroked.

(Laughter) (Applause) And we have big feet to stand off the kitchen sink.

(Laughter) Let me tell you two secrets of success. Surround yourself with the best people and people you love. And choose your partner very carefully.

For the other day when I said, "My husband is an angel," a woman complained - "You are lucky, my husband is still alive," she said.

(Laughter) If it were easy to be successful, we would all be millionaires.

But in my case, it happened during a family trauma, and indeed a crisis.

Our late son, Giles, was an only child, a beautiful, contented baby.

And at the age of two and a half, like a changeling in a fairy tale, he turned from barely speaking into a wild, unruly toddler.

Not a terrible couple. He was severely autistic and never spoke again.

Giles was the first resident of the first home of the first charity I founded to pioneer services for autism.

A landmark Priors Court School for students with autism and a medical research charity also for autism were established.

Because every time I found a gap in the service, I tried to help.

I like doing new things and making new things happen.

And I just started a three-year think tank on autism.

I also founded the Oxford Internet Institute and other IT ventures to put some of my wealth back into the industry.

The Oxford Internet Institute focuses on the social, economic, legal and ethical issues of the Internet, not on technology.

Giles passed away suddenly 17 years ago.

And I learned to live without him, and I learned to live without him.

All I do now is charity work.

Some charities will be looking for me soon, so don't worry about getting lost.

(Laughter) Having an idea for a company is another thing, but as many of you in this room know, it's very difficult to make it happen, and it takes extraordinary energy, confidence and determination, the courage to put your family and home at risk, and a near-obsessive 24/7 effort.

So it's no surprise that I'm a workaholic.

I believe that work is beautiful when it is done humbly and properly.

Work is not just something you do when you want to do other things.

We live life positively.

So what did all this tell me?

I learned that tomorrow will never be like today and it will never be like yesterday.

It has helped me to cope with change, and in fact I have finally welcomed change, but I am told that it is still very difficult.

thank you very much.

(applause)

(click) I was born with bilateral retinoblastoma, retinal cancer.

My right eye was removed at 7 months of age.

I was 13 months old when they removed my left eye.

The first thing I did when I woke up from my last surgery was get out of my crib and start walking around the intensive care unit looking for someone who probably did this to me.

(laughter) Clearly, for me, blind, walking around the nursery wasn't a problem.

The problem was getting caught.

For the visually impaired, the impression of visual impairment is far more threatening than the visual impairment itself.

Think for a moment about your own impressions of being visually impaired.

Think about your reaction when I first went on stage, or the prospect of yourself going blind or someone you love going blind.

This fear is incomprehensible to most of us, as blindness is considered the epitome of ignorance and ignorance, the unfortunate exposure to the scourge of the unknown and darkness.

How poetic!

Luckily for me, my parents weren't poetic.

they were realistic.

They understood that ignorance and fear are only matters of the mind and that the mind is malleable.

They believed I should grow up to enjoy the same freedoms and responsibilities as everyone else.

In their own words, I'm going to leave home - I did when I was 18 - I'll pay my taxes - Thank you - (laughter) - They knew the difference between love and fear.

Fear keeps us immobilized in the face of challenges.

They knew that blindness would pose a significant challenge.

I wasn't raised with fear.

They put my freedom above all else. because that is love.

So, moving on, how are we going to get through today?

The world is a bigger nursery school.

Luckily I have a trusty long cane. This is longer than the canes used by most blind people.

I call it the Liberty Wand.

For example, it prevents me from walking off stage. (Laughter) You can certainly see the edge of that cliff.

They have warned us before that every conceivable calamity is happening to the speakers here on stage.

I don't want to set a new precedent.

But more than that, many of you may have heard my tongue click -- (click) -- when I was on stage.

They are flashes of sound, like sonar on a bat, reflecting off the surfaces around me and returning to me with patterns and pieces of information, just as light does to you.

And my brain, thanks to my parents, was activated to form images from the information patterns in my visual cortex (now called the imaging system), just like yours.

I call this process flash sonar.

In this way, I learned to see through my blindness and learn how to travel through the dark unknown of my own challenges, which earned me the nickname "Batman to Watch".

Come on, Batman, I accept.

Bats are cool. Batman is cool.

But I wasn't raised to consider myself superior in any way.

I have always considered myself like everyone else navigating the dark unknown of their own challenges.

Is it so remarkable?

Use your head instead of your eyes.

Now, someone out there must think this is great, or I wouldn't be here, but let me give it some thought.

Raise your hand if you are facing difficulties or have faced difficulties.

Whoosh. have understood.

Many hands up. Please let me count the number of people.

(click) This will take a while. (click) (laughter) Now, a lot of hands are up in the air.

Leave it alone. I have an idea.

Hands down for anyone trying to use their heads to get through these challenges.

Now, for those who still have their hands up, you have your own agenda. (Laughter) So we are all facing challenges, and we are facing a dark world of the unknown that is unique to most challenges. That's what most of us fear.

But we all have brains that allow us to navigate our journey through these challenges. have understood?

Case in point: I came here -- (click) -- and they didn't tell me where the lectern was.

So the people at TED can't be trusted.

"Find it yourself," they said.

So -- (laughter) And feedback to PA. The system is completely useless.

So now I present you a challenge.

So, could you all close your eyes for a moment?

And you'll learn a little bit about flash sonar.

You will hear a sound.

I'm going to bring this panel in front of me, but I'm not going to move it.

Listen to the sound for a moment.

Shhh.

Well, nothing too interesting.

Now, move the panel and hear what happens to the exact same sound.

Shhh. (Pitch goes higher and higher) You don't know the power of the dark side.

(Laughter) I couldn't stand it.

Now close your eyes, did you hear a difference?

have understood. Well, let's find out.

To challenge, just say "now" when you hear the panel start moving.

have understood? Relax now.

Shhh.

Audience: Come on. Daniel Kish: Good. wonderful.

Open your eyes.

have understood. Even a few centimeters can make a difference.

I have tried sonar.

You will be great blind men. (Laughter) Let's see what happens when we give this activation process some time and attention.

(Video) Juan Luis: It seems that you can see with your eyes and we can see with your ears.

Brian Bushway: It's not a matter of having more or less fun, it's about having fun in a different way.

Sean Marsolay: It comes across. DK: Right.

SM: And it's slowly going down again.

DK: Yes! SM: That's amazing.

I can see the car. Our Lady!

J. Ruchart: I love being blind.

If I had the chance, I honestly wouldn't want to go back to being able to see.

JR: The bigger the goal, the more obstacles you face, but beyond that goal is the victory.

[In Italian] (Applause) DK: Now, do these people look scared?

Not so much.

We have provided activation training to tens of thousands of blind and sighted people of all backgrounds in nearly 40 countries.

When blind people learn to see, sighted people seem to want to learn how to see their way better, more clearly, and with less fear. For this exemplifies the immense capacity within all of us to overcome any kind of challenge, any darkness, and discoveries we never imagined when activated.

We wish you all a more active journey.

thank you very much.

(Applause) Chris Anderson: Daniel, friend.

As you can see, it's a spectacular standing ovation at TED.

Thank you for your wonderful story.

One more question about your world, the inner world you build.

I think there are things in our world that you, the blind, don't have. What is your world like?

What do you have that we don't?

DK: The field of view is 360 degrees, so the sonar works just as well behind me as it does in front of me.

It also works in corners.

Works through surfaces.

In general, it's a kind of fuzzy three-dimensional geometry.

One of my students, now an instructor, when he lost his sight, a few months later, sat in a three-story house and realized that he could hear everything going on throughout the house. Conversations, people in the kitchen, people in the bathroom, floors away, walls away.

He said it's like having X-ray vision.

CA: What kind of situation do you think you're in right now?

How do you imagine this theater?

DK: Frankly, there are many speakers.

That's interesting. You can hear people making noises, laughing, fidgeting, drinking, blowing their noses, everything.

You can hear even the smallest movements of each person.

None escaped my attention, but from a sonar perspective: the size of the room, the curvature of the audience around the stage, and the height of the room.

As I said earlier, I am surrounded by such 3D surface geometry.

CA: Well, Daniel, you've done a great job of helping us all see the world differently.

thank you very much. DK: Thank you.

(applause)

When I was a kid, the disaster that worried us the most was nuclear war.

That is why there were such barrels in the basement, which were filled with cans of food and water.

When the nuke came, we were to go downstairs, crouch down and eat from that barrel.

The greatest risk of global catastrophe today seems nothing like this.

Instead it looks like this:

If anything kills more than 10 million people in the next few decades, it will most likely be a highly contagious virus, not a war.

Microbes, not missiles.

One reason is that we have invested heavily in nuclear deterrence.

In practice, however, we have invested little in systems to stop the epidemic.

We are not ready for the next epidemic.

Let's look at Ebola hemorrhagic fever.

As you may have read in the newspapers, there were many difficult challenges.

I followed it carefully with the case analysis tools we use to track polio eradication.

Looking at what happened, the problem wasn't that there was a system that didn't work well, it was that there was no system at all.

In fact, it's obviously missing an important piece.

We didn't have a group of epidemiologists ready to go to see what the disease was and who would go to see how widespread it was.

The case report arrived on paper.

It was very late and very inaccurate by the time they were published online.

No medical team was available immediately.

We didn't have a way to prepare people.

Well, Doctors Without Borders has done a great job organizing volunteers.

But even then, the sending of thousands of workers into these countries came much later than originally planned.

And in the event of a large-scale epidemic, hundreds of thousands of workers will be needed.

No one was there to discuss treatment.

No one looks at the medical certificate.

No one can figure out what tools to use.

As an example, we could have taken the blood of a survivor, processed it, and returned the plasma to the people to protect them.

However, it was never attempted.

So there was a lot that was missing.

And these are truly global failures.

WHO is funded to monitor epidemics, but it is not funded to do these things that I have spoken about.

Now, in movies it's completely different.

A group of handsome epidemiologists come prepared and move in to save the day, but that's just Hollywood.

If unprepared, the next epidemic could be dramatically more devastating than Ebola Let's take a look at the progression of Ebola this year.

About 10,000 people died, almost all in three West African countries.

There are three reasons why it has not become more popular.

The first is that there has been a lot of heroic work by medical workers.

They found people and prevented further infections.

The second is the nature of the virus.

Ebola hemorrhagic fever is not airborne.

And by the time you're contagious, most people will be sick enough to be bedridden.

Third, it did not invade many urban areas.

And it was just luck.

If it had spread to more urban areas, the number of infected people would have been even higher.

So next time you may not be so lucky.

Even with the virus, taking a flight or going to the market might be enough to make people feel better.

Viruses can originate from natural contagious diseases such as Ebola, or bioterrorism.

So there are events that literally make things a thousand times worse.

In fact, let's look at a model of an airborne virus, like the 1918 Spanish Flu.

So what happens is it will spread all over the world very quickly.

And we know that the epidemic killed more than 30 million people.

So this is a serious problem.

we should be concerned.

But in practice, you can build a very good response system.

We benefit from all the technology we're talking about here.

We have mobile phones to get information from the public and to disseminate information.

We have satellite maps and we can see where people are and where they are moving.

Advances in biology should dramatically change the time it takes to study a pathogen and manufacture a drug or vaccine suitable for that pathogen.

So we can have the tools, but we need to integrate those tools into the overall global health system.

And you need to prepare.

I think the best lesson about how to prepare is still what we do for war.

As for the soldiers, they are waiting to be deployed full-time.

We have reserves that can be scaled up to massive scale.

NATO has task forces that can be deployed very quickly.

NATO has a lot of war games to check, but are people trained enough?

Do they understand fuel and logistics and radio frequencies the same?

Therefore, they are completely ready to leave.

In other words, these things are necessary to deal with epidemics.

what is the important part?

First, poor countries need strong health systems.

Mothers can safely give birth there, and children can receive all vaccines.

But it's also where you'll see trends very early on.

We need a medical reserve. We need a large pool of people with specialized training and experience who are ready to go.

And we need to coordinate those medical workers with the military.

Use your military's ability to move quickly, logistically, and secure areas.

To see where the holes are, you have to do a simulation, a germ game, not a war game.

The last time the germ game was played in the US was in 2001, and it didn't go very well.

Scores so far are bacteria: 1, people: 0.

Finally, much advanced research and development is needed in the field of vaccines and diagnostics.

There are some big advances like adeno-associated viruses that could work very quickly.

I don't have an exact budget for how much this will cost, but I'm pretty sure it will be very small compared to the potential damage.

The World Bank estimates that a global flu pandemic could reduce global wealth by more than $3 trillion and kill millions.

These investments not only protect against epidemics, but also provide significant benefits.

Primary health care, research and development, these will reduce global health equity and make the world fairer and safer.

So I think this should definitely be a priority.

No need to panic.

No need to stock up on spaghetti cans or go to the basement.

But time is not on our side, so we have to move on.

In fact, if there's one good thing about the Ebola epidemic, it's that it can serve as an early warning, or wake-up call, to prepare.

Get started now and you'll be ready for the next fad.

thank you.

(applause)

Hello my name is Kevin.

I'm from Australia. i am here to help.

(Laughter) Tonight I'd like to talk about a tale of two cities.

One of those cities is called Washington and the other is called Beijing.

Because how these two capitals shape the future of our two nations, the future of the United States, and the future of China will not only affect these two countries alone, but it will affect us all in ways we probably never thought possible. It affects the air we breathe, the water we drink, the fish we eat, the quality of our oceans, the languages ​​we speak in the future, the jobs we get, the political systems we choose and, of course, the larger issues of war and peace.

can you see that guy? he is french

His name is Napoleon.

Hundreds of years ago, he made the astounding prediction that China was a sleeping lion, and when she awoke the world would tremble.

Napoleon made some mistakes. He got this completely right.

Because today, China has not just woken up, it has risen and marched on. And the question for all of us is where will China go and how will it engage with this 21st century giant?

When you start looking at numbers, numbers start facing you in a big way.

China is projected to become the world's largest economy over the next decade, by both PPP and market exchange rate measures.

They are already the largest traders, they are already the largest exporters, they are already the largest producers, they are also the largest carbon emitters in the world.

America comes in second.

So if China becomes the world's largest economy, consider the following. For the first time since this man ascended the British throne, George III, who is not a good friend of Napoleon, a non-English-speaking, non-Western, non-liberal democratic country will become the world's largest economy.

And if you don't think it affects the way the world will be in the future, personally, I think you smoked something, but that doesn't mean you're from Colorado.

So the question for us tonight is how do we make sense of this colossal change that I believe is the greatest change of the first half of the 21st century?

It affects so many things.

Get to the absolute core.

It's happening quietly. It's happening continuously.

In a way, it's happening in secret because we're all preoccupied with what's happening in Ukraine, what's happening in the Middle East, what's happening with ISIS, what's happening with ISIL, what's happening in the future of our economy.

This is a slow, silent revolution.

And with big changes come big challenges. The big challenges are: China and the United States, that is, China, the Middle Kingdom, and the United States, by the way, Meiguo, which means "beautiful country" in Chinese, can you really do it?

please think about it. That's the name China has given this country for over 100 years.

Can these two great civilizations, these two great nations really carve out a common future for themselves and the world?

In short, can we carve out a peaceful and mutually prosperous future, or are we facing the grand question of war or peace?

And I have 15 minutes to work on war or peace. This is a little less time than this man has been given to write the book War and Peace.

I am often asked why a child who grew up in rural Australia was interested in learning Chinese.

Well, there are two reasons for that.

This is the first of them.

It's Betsy the Cow.

Well, Betsy the cow was one of a herd of dairy cows I grew up with on a farm in rural Australia.

Can you see the hand there? They are not made for agricultural use.

So I realized very early on that working on a farm wasn't really for me, and that China could very safely keep me away from a farm-living career in Australia.

The second reason is:

that's my mother

Has anyone here heard a mother say?

Have you ever done what your mother told you to do?

It seldom happened, but one day my mother handed me a newspaper. The headline read, "Here's a big change."

And that change is China's accession to the United Nations.

In 1971, I had just turned 14, and she handed me this headline.

And she said, "Understand this and learn, because it affects your future."

So, being very good at studying history, I decided that going to actually learn Chinese was the best thing for me.

The great thing about learning Chinese is that your Chinese teacher gives you a new name.

So they gave me this name. Kè means to overcome or conquer, and Wén is the letter for literature and art.

Kay Wen, Classical Conqueror.

Do any of you have someone called "Kevin"?

Going from Kevin to Classical Conqueror is a big step forward.

(laughter) I've been called Kevin all my life.

Have you been called Kevin all this time?

Want to be called a classic conqueror?

So I retired after that and joined the Australian Department of Foreign Affairs. But there is pride here, and before pride there must be collapse.

So I was at the Embassy in Beijing and went to the Great Hall of the People with the Ambassador who asked me to translate for the first meeting at the Great Hall of the People.

And so was I.

If you've ever been to a conference in China, it's a giant horseshoe.

At the head of the horseshoe there is a really serious poo bar, and at the end of the horseshoe there is a not-so-serious poo bar: a junior woodchuck like me.

So the ambassador began with these vulgar words.

"China and Australia are now enjoying an unprecedentedly close relationship," he said.

And I thought to myself, 'That sounds clumsy, it sounds strange.

We will improve it. ”

Note to file: DO NOT DO IT!

It needed to be a little more elegant and a little more classic, so I rendered it like this:

[in Chinese] There was a great silence on the other side of the room.

On the head of the horseshoe was a giant poo bar, blood visibly pouring from its face, and on the other side of the horseshoe I could see a young woodchuck giggling uncontrollably.

Because when I described his sentence as "Australia and China enjoy an unprecedented close relationship," what I really meant was that Australia and China are now experiencing wonderful orgasms.

(Laughter) That was the last time I was asked to translate.

But that little story contains wisdom. That means that as soon as you think you know something about this extraordinary civilization with 5,000 years of history, you can always learn something new.

When it comes to the United States and China building a common future together, history is against us.

Is this person here?

He is neither Chinese nor American.

he is greek His name is Thucydides.

He wrote the history of the Peloponnesian War.

And he gave this amazing view of Athens and Sparta.

"It was the rise of Athens and the terror it caused in Sparta that made the war inevitable."

Therefore, we need the entire literature on what is called the Thucydides Trap.

Is this person here? He is neither American nor Greek. he is chinese

His name is Sun Tzu. He wrote "The Art of War" and if you look at his statement below it says: "Attack where you are not ready, show up where you least expect it."

Things are not looking good for China and the US right now.

This man is American. His name is Graham Allison.

In fact, he is a teacher at the Kennedy School in Boston.

He is now working on a single project: applying the Thucydides trap about the inevitable war between rising and established powers to the future of China and the United States. relationship?

It's a core question.

And what Graham did is examine 15 cases in history since the 1500s to establish what the precedent is.

And let me tell you, 11 out of 15 ended in devastating wars.

"But Kevin, or Classic Conqueror, that's in the past," you might say.

We now live in a world of interdependence and globalization.

It will never happen again. ”

guess what?

Economic historians tell us that, in fact, we reached the peak of economic integration and globalization in 1914, just before World War I, a solemn reflection of history.

So how can we get to the bottom line of how China thinks, feels, and stands toward the United States, and vice versa, how these two nations and civilization can work together when grappling with this big issue?

First, let's actually look at China's view of the United States and other Western countries.

Part 1: China feels humiliated at the hands of the West throughout its 100-year history, beginning with the Opium Wars.

After that, the West cut China into pieces, and in the 20s and 30s, billboards like this began appearing on the streets of Shanghai.

[“Dogs and Chinese No Trespassing”] If you were Chinese, how would you feel if you were in your country and saw that sign?

China also believes and feels like what happened to China's German colonies when the 1919 Paris Peace Conference returned German colonies to every nation in the world.

In fact, they were given to Japan.

When Japan invaded China in the 1930s, the world turned away and didn't care what happened to China.

And on top of that, the Chinese still believe to this day that the United States and the West have not accepted the legitimacy of their political system. Because its political system is fundamentally different from those of us who come from liberal democracies, we believe to this day that the United States seeks to undermine its own political system.

China also believes it is being contained by US allies and countries with strategic partnerships with the US.

just around it.

And more than that, the Chinese feel, deep down and deep down, that we Westerners are too arrogant.

In other words, we are unaware of the problems in our system, politics and economics, and are quick to blame others, believing indeed that we in the West are guilty of many hypocrites.

Of course, there is more to international relations than just the clapping of one hand.

There is another country, called the United States.

So how will the US react to all of the above?

The United States has a response to each of them.

When asked if the US is containing China, they say, "No, look at the history of the Soviet Union. It was containment."

Instead, what we have done in the US and in the West is to welcome China into the global economy and then welcome China into the World Trade Organization.

The U.S. and Western countries allege that China is committing wrongdoing through intellectual property disputes and cyberattacks against U.S. and global companies.

The United States further argues that China's political system is fundamentally wrong and fundamentally disconnected from the human rights, democracy and rule of law enjoyed in the United States and in the West.

All of the above, plus what is the US saying?

They fear that when China becomes powerful enough, it will establish spheres of influence in Southeast Asia and wider East Asia, push the United States out, and eventually seek to unilaterally change the rules of the world order when it becomes strong enough.

Other than that, the relationship between the US and China is going very well and is great.

No real problems there.

But the challenge is, given these deep-seated feelings, deep-seated feelings and thought patterns, what the Chinese call the "Four Wei", and ways of thinking, how can we lay the groundwork for a common future for these two?

I simply advocate: Because of our common purpose, we can do so within the framework of constructive realism.

What does that mean?

Be realistic about your disagreements and adopt a management approach that keeps them from escalating into war or conflict until you have the diplomatic skills to resolve them.

It will be constructive in the field of bilateral, regional and global engagement between our two countries, which will bring about change across humanity.

Build an Asia-Pacific Community, a regional organization that can cooperate in Asia.

And around the world, take more action, like you started late last year, by joining hands instead of fists to fight climate change.

Of course, all this will happen if there is a common mechanism and political will to achieve the above.

These items are available for delivery.

But the question is, can they be realized on their own?

This is what our heads tell us to do, but what about our hearts?

I have a bit of experience back home with the question of how you're trying to bring two people together who frankly didn't have much in common before.

And at that time, I apologized to the Indigenous peoples of Australia.

It was a day of reckoning for the Australian Government, the Australian Parliament and the Australian people.

After 200 years of endless abuse of the first Australians, it's time for us whites to say sorry.

The important thing -- (applause) The important thing I remember was looking into the faces of all the Australian Aborigines who came to hear this apology.

For example, it was insane to see old ladies, like this lady here, telling me stories of when they were literally separated from their parents at the age of five.

Afterwards, it was extraordinary for me to be able to hug and kiss the Aboriginal Elders as they entered the Houses of Parliament. One woman told me that she had never been kissed by a white man and she was over 70 years old.

It's a terrible story.

And I remember this family saying to me, "We drove from the far north to Canberra, through the countryside, to get to this point.

After apologizing on the way home, I stopped by a cafe and drank a milkshake. ”

And they entered this café quietly, hesitantly, cautiously, and a little uneasy.

I hope you know what I'm talking about.

But what happened the day after the apology?

Everyone in that cafe, all white people, stood up and applauded.

Something happened to the hearts of the Australian people.

White people, Aboriginal brothers and sisters, and we didn't solve all these problems together, but let me tell you, we went to the heart, not just the head, so there was a new beginning.

So what are the conclusions about the big question we are being asked to address tonight: the future of U.S.-China relations?

The head says there is a way forward.

He said there is a policy framework, a common story and a mechanism through regular summit meetings to implement and improve these things.

But the mind must also find a way to reconsider the possibilities of US-China relations, and of China's future involvement in the world.

Dear ones, sometimes you may need to take a leap of faith with no idea where you are going to land.

In China, people are talking about the Chinese Dream now.

In the United States, the phrase “American dream” is well known.

I think the time has come for the world to think about what could be called the dream of all mankind.

Because that might change the way you think.

[in Chinese] That's my challenge to America. That is my challenge to China.

That is my challenge to all of us, but I believe that with the will and the imagination, we can transform this into a future driven by peace and prosperity, and prevent the tragedy of war from ever repeating itself.

thank you.

(Applause) Chris Anderson: Thank you very much. I'm really thankful to you.

I feel like you are also playing a role in this liaison.

You are, in a way, in a unique position to be on both sides.

Kevin Rudd: Well, what we Australians do best is organize drinks. So we'll put the drinks together in one room, we'll suggest this, we'll suggest that, and then we'll go get the drinks.

But no, there is something you can do for all of us friends of these two great nations, America and China.

You can make a practical contribution. And good people here, the next time you see someone from China, sit down and have a conversation.

See where they come from and what they are thinking. And my challenge to any Chinese who will watch this TED talk one day is to do the same.

The two of us who want to change the world can actually make a big difference.

Those in between us can make a small contribution.

CA: Kevin, all the best to you, my friend. thank you.

KR: Thank you. Thank you guys.

(applause)

We are at a turning point in human history, and humanity is now on the verge of winning a star or losing the planet we call home.

Even in just the past few years, we have greatly expanded our knowledge of how the Earth fits within the cosmic context.

NASA's Kepler program has discovered thousands of potential planets around other stars, indicating that Earth is just one of billions in our galaxy.

Kepler is a space telescope that measures the subtle dimming of stars as planets pass in front of us, blocking just a fraction of that light from reaching us.

Kepler's data reveal the planet's size and distance from its parent star.

Taken together, these help us understand whether these planets are as small and rocky as our solar system's terrestrial planets, and how much light they receive from their parent Sun.

Furthermore, this provides clues as to whether these planets we have discovered are habitable.

Unfortunately, just as we discover a treasure trove of potentially habitable worlds, our planet is sinking under the weight of humanity.

2014 was the hottest year on record.

The glaciers and sea ice that have been with us for thousands of years are disappearing within decades.

These planetary environmental changes we have caused are rapidly outstripping our ability to change their course.

But I'm an astronomer, not a climatologist.

I study the habitability of star-influenced planets in hopes of finding places in space where life beyond ours may be discovered.

You could say I'm looking for the best foreign real estate.

Now, as someone deeply involved in the search for life in space, I can say that the more we seek out planets like Earth, the more we appreciate our planet itself.

Each of these new worlds prompts comparisons between the newly discovered planets and those we know best: the planets of our solar system.

Think about our neighbor Mars.

Mars is small, rocky, and a little far from the Sun, but it might be considered a habitable world if discovered by a mission like Kepler.

In fact, Mars may have been habitable in the past, which is also part of the reason why we study Mars so intensely.

Our rover, like Curiosity, will crawl its surface, looking for clues about the origin of life as we know it.

Rovers like the MAVEN mission are sampling the Martian atmosphere to try to understand how Mars lost its past habitability.

Private spaceflight companies now offer not only short trips to near space, but the tempting possibility of living our lives on Mars.

But while these views of Mars resemble the deserts of our home world, which are associated in our imagination with ideas about frontiers and frontiers, compared to Earth, Mars is a pretty awful place to live.

Consider how little we have colonized the deserts of our planet, which are lusher than Mars.

Even in the driest and highest elevations on earth, the air is sweet and rich with oxygen exhaled from rainforests thousands of miles away.

I'm worried I fear that this excitement about colonizing Mars and other planets is casting a long dark shadow. It is the allusion and belief of some that Mars is there to save us from the self-destructive destruction of Earth, the only truly habitable planet we know of.

I love interplanetary exploration, but I strongly disagree with this idea.

There are many great reasons to go to Mars, but when someone says they're coming to Mars to help humanity, it's like the captain of the Titanic telling you the real party will be in the lifeboat after this.

(Laughter) (Applause) Thank you.

However, the goals of interplanetary exploration and planetary conservation are not mutually exclusive.

No, they are actually two sides of the same coin: understanding, sustaining, and improving life for the future.

The extreme environment of our world is an alien view.

they are very close to home.

If we could understand how to create and maintain habitable spaces out of hostile and inhospitable spaces on Earth, perhaps we could meet the needs of both maintaining our own environment and moving beyond it.

As a final thought experiment, I would like to introduce Fermi's paradox.

Many years ago, physicist Enrico Fermi asked that evidence of extraterrestrial life should have been discovered by now, considering the fact that our universe has been around for a very long time and is expected to have many planets in it.

So where are they?

Well, one possible solution to the Fermi paradox is that as civilizations become technologically advanced enough to consider living among the stars, they lose sight of how important it is to protect the home world that facilitated that progress in the first place.

It is presumptuous to believe that interplanetary colonization alone can save ourselves, but planetary preservation and interplanetary exploration can go hand in hand.

If we truly believe that the harsh environment of Mars can be bent for human habitation, we should be able to overcome the much easier task of maintaining Earth habitability.

thank you.

(applause)

Virtual reality for me started in a kind of unusual place.

It was the 1970s.

I entered this field very young, at the age of 7.

And the tool we used to access virtual reality was the Evel Knievel stunt cycle.

Here's a commercial for that particular product: (video) Narration: What a great jump!

Evel rides a great stunt cycle.

Its gyroscopic power allows it to travel over 100 feet at top speed.

Chris Milk: So this was my pleasure at the time.

I have ridden this bike everywhere.

And I was there with Ebel Niebel. We dived into Snake River Canyon together.

I wanted a rocket.

I never got a rocket, just a bike.

I felt so connected to this world.

I didn't want to be a storyteller when I grew up, I wanted to be a stuntman.

i was there. Ebel Niebel was my friend.

I sympathized with him so much.

But it didn't work. (Laughter) I was in art school.

I started making music videos.

Here is one of the early music videos I made: (Music: "Touch the Sky" by Kanye West) CM: You may notice some similarities here.

(Laughter) And I got that rocket.

(Laughter) So now that I'm a filmmaker, or a beginning filmmaker, I started trying to use the tools available to me as a filmmaker and try to tell the audience the most compelling story possible.

And cinema is a wonderful medium that allows us to empathize with people who are very different from us and a world that is very different from ours.

Unfortunately, Ebel Niebel didn't feel the same empathy we had for him, and he sued us about this video shortly after (laughs).

On the contrary, I was finally able to get an autograph from the person I admired as a child and the person I wanted to be as an adult.

(Applause) So let's talk about movies.

Film is a great medium, but at its core it is still the same.

This is a rectangular group that is played in a sequence.

And we've done some amazing things with those rectangles.

But then I started thinking. Is there a way, using the latest and emerging technologies, to tell different kinds of stories in different ways than the traditional filmmaking tools that have been in use for 100 years?

So I started experimenting. What I was trying to do was build the ultimate empathy machine.

And here's one of the early experiments: (music) It's called "The Wilderness Downtown."

It was a collaboration with Arcade Fire.

At the beginning, I was asked to fill in the address of the place where I grew up.

Website.

And from there, little boxes with different browser windows start growing.

And then, seeing this teenager running down the street, looking at the images on Google Street View and Google Maps, I realized that the street he was running on was mine.

And when he stops in front of your house, he also stops in front of your house.

This is great and I've seen people have an even deeper emotional response to this than what I've made with the rectangle.

And I'm basically taking a piece of your history and putting it into a narrative framework.

But then I started thinking, it's a part of you, how can you all be in the frame?

That's why I started making art installations.

And this is what is called "betrayal of the sanctuary."

It's a trilogy. Introducing the third panel.

(music) Well, I put you in the frame, and I've seen people have an even more instinctive emotional response to this piece than their predecessor.

But then I started thinking about frames. What do the frames represent?

And the frame is just a window.

In other words, all media, television and movies we watch are windows into another world.

And I thought, well, great. I framed you

But I don't want you in the frame, I don't want you in the window, I want you outside the window, I want you on the other side, in the world, living in the world.

So I go back to virtual reality.

Let's talk about virtual reality.

Unfortunately, talking about virtual reality is like dancing about architecture.

This is someone actually dancing about architecture in virtual reality.

(laughs) So it's hard to explain. Why is it so difficult to explain?

It is difficult because it is a very experiential medium.

You feel yourself moving into it.

It's a machine, but inside it feels like real life, it feels like the truth.

And you feel present in the world you are in, with the people you are with in it.

So I'm going to show you a demo of a virtual reality film. This is a full screen version of all the information you get when shooting virtual reality.

So we shoot from all directions.

This is a camera system we built with an omnidirectional 3D camera and an omnidirectional binaural microphone.

We take advantage of this to basically build a sphere of the world you live in.

So what I'm about to show you isn't a world view, it's basically the whole world stretched out into a rectangle.

The film is called 'Clouds Over Sidra' and was produced in collaboration with a virtual reality company called VRSE, the United Nations, and co-creator Gabo Arora.

And so we went to a Syrian refugee camp in Jordan in December, where we filmed the story of a 12-year-old girl named Sidra.

She and her family fled Syria through the desert to Jordan and have been living in this camp for the past year and a half.

(Video) Sidra: My name is Sidra.

i am 12 years old

I'm in 5th grade.

I am from Inkir city, Daraa governorate, Syria.

I have been living in Zaatari camp in Jordan for the past year and a half.

i have a big family. I have three siblings, one of whom is a baby.

he cries a lot

When I asked my father if he cried when I was a baby, he said he didn't.

I think I was a stronger baby than my brother.

CM: So when you're in the headset.

you don't see it this way.

you look out over the world

You'll notice that you can see 360 ​​degrees in all directions.

And when you're sitting in her room looking at her, you're not looking at it through a TV screen, you're not looking through a window, you're sitting there with her.

Look down and you're sitting on the same ground she's sitting on.

That's why I can feel her humanity more deeply.

You empathize with her more deeply.

And I think this machine can change the way you think.

And we're already trying to make some changes.

So we brought the film to the World Economic Forum in Davos in January.

And we showed it to a group of people whose decisions impact millions of lives.

And these are people who might not otherwise have sat in tents in Jordanian refugee camps.

But in January, one afternoon in Switzerland, they suddenly realized they were all there.

(Applause.) And they were affected by it.

So we will make more.

We are currently working with the United Nations to film these entire film series.

We just finished filming a story in Liberia.

And now we plan to shoot the story in India.

We shoot these films and show them to people who work there or visit the United Nations.

And we're showing people movies that can actually change the lives of the people in them.

And I think that's where we're just beginning to scratch the surface of the true power of virtual reality.

Not a video game peripheral.

It connects humans with other humans in profound ways never seen in any other form of media.

And it can change people's perceptions of each other.

In this way, I believe virtual reality has the potential to actually change the world.

So this is a machine, but through this machine we become more compassionate, more empathetic, more connected.

And ultimately, we become more human.

thank you.

(applause)

In many ways, it's nice to be able to look at life objectively.

The problem is that we have such colored glasses when looking at all kinds of situations.

For example, consider something as simple as beer.

If you let people taste several beers and rate them for strength and bitterness, different beers will occupy different spaces.

But what if we try to be objective about it?

For beer it's very simple.

What would happen if we did a blind tasting?

Well, if we did the same thing and you tasted the same beer, this time in blind tasting things would look a little different.

Most of the beers gather in one place.

They are basically indistinguishable, with the exception of course Guinness.

(Laughter) Similarly, you can think about physiology.

What happens when people expect something from their physiology?

For example, we sold painkillers to people.

I told some people that the medicine was expensive.

Some people said it was cheap.

And expensive painkillers worked better.

Expectation changed our physiology, so people felt less pain.

And of course, in sports, we all know that if you're a fan of a particular team, you can't help but watch the game unfold from your team's point of view.

So these are all cases where our preconceived notions and expectations color the world.

But the more important question is what happened?

What happened to questions related to social justice?

So we wanted to consider what the blind-tasting version of thinking about inequality might be.

So we started researching inequality and conducted several large-scale studies in the United States and other countries.

So we asked two questions. Do people know how much inequality we have?

And how much inequality do we want to achieve?

Now let's consider the first question.

Imagine I took all the people of the United States.

And I sorted them from the poorest on the right to the richest on the left, and then divided them into five buckets: the poorest 20 percent, the next 20 percent, the next, the next, and the richest 20 percent.

I asked them to tell me how much wealth they thought was concentrated in each bucket.

Now, for the sake of clarity, imagine I want you to tell me how much wealth do you think is concentrated in the bottom two buckets, the bottom 40 percent.

wait a minute. Think carefully and have a number.

We usually don't think about it.

Think for a moment and get the actual numbers in your head.

do you have it

Now, many Americans are telling us this.

They think the bottom 20 percent have about 2.9 percent of the wealth, and the next group has 6.4 percent, for a total of just over 9 percent.

The next group, they say, is 12%, 20%, and the richest 20%, people think, hold 58% of the wealth.

I can see how this relates to your thinking.

So what is reality?

The reality is a little different.

The bottom 20 percent have 0.1 percent wealth.

The next 20 percent have 0.2 percent wealth.

Combining both gives 0.3.

The next group is 3.9, 11.3, with the richest group holding 84-85% of the wealth.

So what we really have and what we think we have are very different.

what about what we want?

How do we make sense of this?

So to look at this, to look at what we really want, we thought of the philosopher John Rawls.

If you remember John Rawls, he had a notion of what a just society was.

A just society, he said, is one in which you would be willing to enter random places if you knew everything about it.

This is a beautiful definition. Because if you are wealthy, you might want the rich to have more money and the poor to have less.

Poor people may want more equality.

But if you're going to go into that society in every conceivable situation, if you don't know it, then you have to consider every aspect.

This is a bit like blind tasting, where you don't know what the outcome will be when making a decision, which Rawls called "the veil of ignorance."

So we took another group, a large group of Americans, and questioned them with a veil of ignorance.

What characteristics of a country would make you want to participate even though you know it could end randomly anywhere?

And this is what we got.

What did people want to give the first group, the bottom 20 percent?

They wanted to give them about 10 percent of their wealth.

The next group are the 14 percent of the wealthy, 21, 22 and 32.

Well, no one in our sample wanted perfect equality.

No one in our sample thought socialism was a great idea.

But what does that mean?

It means that there is a knowledge gap between what we have and what we think we have, but there is at least as big a gap between what we think is right and what we think we have.

Now, we can ask questions not just about wealth, such as:

You can also ask about other things.

For example, I asked people in different parts of the world about this question, liberals and conservatives, and they basically gave the same answer.

When I asked rich and poor, men and women, NPR listeners and Forbes readers gave the same answer.

We asked people in England, Australia and America, and the answers were very similar.

I also asked various departments of the university.

We went to Harvard and looked at just about every department. In fact, at Harvard Business School, there were a few people who wanted the rich to have more and the poor to have less, and the similarities were striking.

I think some of you went to Harvard Business School.

I also asked this question about something else.

We asked what the ratio of CEO salaries to unskilled workers is.

So you can find out what people think the ratio is, and then you can ask them what they think the ratio should be.

And we can ask what is reality?

What is reality? And you might say, "Well, that's not so bad, is it?"

Red and yellow are not the same.

But actually, it's because they're not drawn on the same scale.

It's hard to tell, but it's yellow and blue.

But what about the other consequences of wealth?

Wealth is not just wealth.

We asked what about health and such.

What about prescription drug availability?

What will life expectancy be?

What will happen to the life expectancy of infants?

How would you like to distribute this?

What about educating young people?

And for the elderly?

Putting all this together, we've learned that while people don't like wealth inequality, there are other things that wealth inequality that results from are even more disgusting. For example, inequalities in health and education.

We also found that people were particularly tolerant of changes in equality when it came to people with less agency, namely young children and babies. Because we don't think they are responsible for their situation.

So what are the lessons to be learned from this?

We have two gaps. There is a knowledge gap and a desirability gap. Knowledge gaps think about how to educate people.

How can we get people to think differently about inequality and its consequences in terms of health, education, jealousy, crime rates, etc.?

Then there's the desirability gap.

How do we get people to think differently about what we really want?

You see, Rawls' definition, Rawls' view of the world, and the blind tasting approach remove our selfish motives from the big picture.

How can we implement it on a broader scale and more sophisticatedly?

And finally, there is also the action gap.

How do we take these things and actually do something about them?

I think part of the answer is thinking about people like young children and babies who don't have a lot of agency.

In summary, the next time you go out for a beer or wine, first of all ask yourself what is real in your experience and what is an expected placebo effect in your experience.

And think about what that means for other decisions in your life, and hopefully for policy issues that affect us all.

Thank you very much.

(applause)

Dan Holtzman: Throw away the beanbag chair. please.

Barry Friedman: There are all sorts of high tech chairs out there today, but I think this is the peak when it comes to ergonomics, comfort, design, flexibility...

DH: Obviously this is not what we do on our regular shows. This is what we learned for this, so let's try it. But could you provide us with the music that inspires the beanbag chair?

BF: Great show, Daniel, great show. You are the man!

nice show. Oh man, that was great!

DH: Thank you.

BF: You know, when people do things like that, they can get really depressed.

you actually just did it. (Laughter) That's the kind of extra effort that got us where we are today...

DH: Alright, let me show you something special.

BF: ...without MacArthur's grant.

yes, see this. As you know, different kinds of...

Let's be honest, TED is about invention. right? DH: Yes, yes.

BF: Last night Michael Moshen showed off some of the juggling props he invented and is working on.

Now Dan is going to show off what he actually invented.

DH: It's a kind of juggling that I actually invented right after I saw other jugglers doing it.

BF: Shut up. (laughter) DH: And this is a small excerpt from a long article.

(Laughter) (Applause) Guys, this is shaker cup juggling. It's not drastic, but it definitely slows things down.

BF: Oh, yeah. (drumroll) BF: Oh, Daniel.

(Applause) DH: One more thing? (drumroll) Perfect. (Drumroll) Perfect. (drumroll) BF: OK. DH: Oh! have understood.

(Applause.) I'm getting lucky now. Skipping to 6 cups.

To do 6 bowls, you need perfect control of 3 bowls with your right hand. (drum roll) BF: 3 on the left.

DH: Perfect.

(Laughter) And now all six. Should it do it on the first try, or should it fail once on purpose? (laughs) BF: Would you like to try it first? On purpose once?

(Audience: Once on purpose!) DH: Why not try it first and then decide?

BF: Good idea. (Laughter) Let's put that aside. Leave that door open.

(Laughter) (Applause) DH: He's looking at me.

BF: No problem, he will. have understood.

DH: Oh! I need Richard's help. (Laughter) Oh, good. have understood.

BF: You know, over the years, it's kind of a tradition at conferences to do something risky with Richard every year. And we've always done something with the whip in our act. Funny thing, I used to do that for years with Daniel holding balloons.

And we thought, "How stupid!"

DH: Excuse me, can I work on the design of the mic?

BF: I think it's the next session.

DH: What about the next session?

BF: Right. So we actually found a way to incorporate Richard into this.

In fact, he takes more risks on this.

DH: Stand up, Richard. (Whip cracks) Oh, I'm sorry. (laughter) DH: Come on, Richard, please... (whip clangs) BF: OK, I'm sorry.

DH: Jesus Christ. Stand in front of me, Richard.

Richard Wurman: Can I say something?

BF: Right.

RW: I've been rehearsing with them for the past few years, and what happened to me, I have no idea what's going to happen, and that's the truth.

DH: Okay, stand in front of me...

God, I hate that. Please reach out like this.

(laughs) BF: No, stay with him.

Dan used to actually hold them, but now he's holding you for protection.

It's kind of beautiful. OK.

(laughter) DH: Wow, you're training.

BF: No, shut up!

(Laughter) We'll have a little Richard time. Good, good.

yes, I'll go.

Let him grab your wrist...

DH: Hold my wrist. BF: Yeah, wait a minute.

Here you go.

(laughter) Okay.

Yes, please wait.

RW: Hmm.

(laughs) DH: First.

BF: I'm getting another mid-year phone call right now, Richard.

(laughter) DH: So Richard, what were we on the list? Like 1,020?

(laughs) What happened there?

BF: I think we were just outside.

DH: I don't know. (Applause) (Laughter) DH: Sorry. BF: Has some bad flashbacks.

RW: Do you want me to hold you or do you prefer not to hold me? DH: Don't hold me so tight.

BF: Come on, I'll take it. (balloon pops) (applause) DH: One more, one more.

BF: I have one more thing to do.

RW: Can I hug you?

BF: You wouldn't want to have this, believe me.

DH: Could you spread your legs a little?

(laughs) BF: Gloria, do you want to do it? It is very good.

(Laughter) (Applause) (Laughter) Try again. Hmm, I don't want to get too close.

(Laughter) Could you press that?

(Applause) DH: Great! boy!

BF: That's great. I've always wanted to try it.

(laughs) DH: But let's jump over here.

Well, we risked Richard's life, but it makes sense to risk our own.

To do so, he wields these three extremely sharp scythes.

Even if that wasn't enough, judging by your response, it's more than that...

(laughs) DH: Wow! BF: Expect a few more builds.

DH: Right. Barry…

BF: I'll run after him.

DH: Jump over my shoulder.

BF: Raise your shoulders.

DH: Grab the blade in the air and land in a puddle of blood...

(laughs) I still juggle. (Laughter) Do you think it's impossible?

BF: Incredible, do you think so?

DH: Why bother?

BF: Let's go.

DH: Just juggler boys?

BF: This man, this man invented air.

DH: I think so, you're right.

even a pencil.

BF: He invented the pencil.

DH: Okay, we'll do the trick, but keep in mind it took over ten years to perfect.

BF: It will take 10 years to perfect, but we'll find out soon enough.

DH: It's not that hard. We just don't want to practice too much.

BF: No, it's a hassle. travel too much.

In fact, it takes a little time to prove that the blade is indeed razor-sharp -- this could be fake.

DH: Can someone throw a little farm animal up on stage?

(laughs) Or a sacrificial virgin?

BF: Anything?

DH: Where's Gloria? (laughter) BF: No, she...has livestock.

DH: Do you have small livestock?

I'm just trying to bet the odds. OK, let's go.

BF: Too much, too much.

DH: How are you feeling, Barry? how are you feeling

BF: Yes, it's fine.

DH: Do you think everything will be fine? The atmosphere, the...

BF: Well, it's kind of rough.

DH: Are you okay so far?

BF: Right.

DH: Let's go.

BF: This is kinda… who does the lighting? Could you look at me a little more directly? Is that possible? (laughs) I can still see a little.

DH: And turn up the intensity. The center is still pink.

I've gone too far. (laughs) BF: Yeah, it's too far. It's too visual.

The body design is completely different.

DH: Are you ready, Barry? BF: Too much.

DH: Could you play our jump music please? (Pauses) Can you do it a little louder?

(laughs) BF: They're a good crew! Wow!

DH: Oh, sorry. have understood.

BF: I will continue.

DH: Okay, I'll try again.

BF: Okay? Oh my God oh.

DH: Okay, let's go. sorry.

BF: I thought I had a difficult part. OK.

DH: Whenever I'm ready.

BF: Let's go!

(Applause.) Alright, wake up! Let's dance! DH: Dance, come on. BF: Come on, dance!

Somebody dance! come!

(Applause.) Whoa, whoa, okay, stop.

It's funny, nobody dances. We are two people doing this. (Laughs) I think it's offensive to everyone.

DH: The French judge...

BF: One more quick thing.

DH: The French judge gave a score of 5.2.

(laughs) BF: Well...

DH: See... BF: Oh yeah. Another one comes in.

DH: Tell us about our background and so on.

BF: Right. You may have read in our bio that we won the juggling world championship twice.

And believe it or not, the Bullwhip and Shaker Cup aren't going to get you the juggling champion.

I'm going to show you right now an excerpt from the routine I used to wipe out the competition of other juggling teams.

DH: That's right.

BF: Good.

DH: I know what you're thinking. Other juggling teams must be really bad.

(laughs) BF: Juggling has a bad reputation.

DH: But wait, Barry, I still have another club at my feet.

And look, we have twins!

BF: Shut up. (laughter) DH: I still have one at my feet.

what do you want to do with it?

BF: Richard, you told him this was your last year. (laughter) DH: That's a pretty good setup, Richard.

BF: Yeah, that's a good setting. That's a big setting.

DH: Nothing better than this. have understood. What I do: Use reflexes like a leopard.

BF: Good.

DH: Okay. Reach down and grab the club with a steel grip.

BF: Good.

DH: I touched it, Barry. That's enough.

BF: That's progress, that's the problem.

(laughs) DH: How about that? I will do it again.

Oh wait, it's on your side, Barry.

And it's very windy there.

BF: Yeah, it's weird. You might not think it affects half the stage, but it does. It's strange.

Look at this. What I'm trying to do is slide the 7th one over the leg.

DH: Wow! Great trick, Barry!

Oh look how it's lying there.

Oh Barry, is there anything you can't do?

(laughs) You are my hero. You are my Jim Cie Jr.

too many olympics

BF: Try kicking the 7th club from your foot. please.

DH: Barry, where are you? where? Tell me, Barry.

[unintelligible] is looking forward to your next syllable. What is that?

What kind of jewel is knowledge?

What a pearl of wisdom!

Want to buy some vowels, Barry?

Is that your final answer?

BF: Okay! Sometimes I have to turn off the TV.

DH: Yes, yes.

BF: It's a seven kick-up from my leg.

DH: Juggle seven.

BF: From 6:00 to 7:00. DH: That's a world record. BF: Really? DH: For us.

BF: Yes.

DH: Whenever I'm ready.

Stick your tongue out, Barry.

BF: Oh, oh, oops.

(Applause) DH: Please stay seated. Please remain seated. thank you.

Because to make this twice as difficult, you'll be juggling 7 clubs back...

BF: Seven Club Juggling.

DH: ...in the back.

BF: Thank you, that's all.

BF: Thank you!

DH: Thank you!

We would like to take you on an epic adventure on the Rosetta spacecraft.

Escorting and landing spacecraft on comets has been my passion for the past two years.

For that, we need to explain the origin of the solar system.

Dating back 4.5 billion years ago, there were clouds of gas and dust.

At the center of this cloud our Sun formed and ignited.

Together they formed what we now know as planets, comets and asteroids.

The theory is that what happened next is that when the Earth cooled a little after its formation, a comet slammed into it, supplying it with water.

They probably also delivered complex organic matter to Earth, which may have caused the emergence of life.

This can be compared to having to solve a 250-piece puzzle rather than a 2,000-piece puzzle.

Then large planets like Jupiter and Saturn, not where they are today, interacted gravitationally, sweeping the entire interior of the solar system, and what is now known as a comet ended up in what is called the Kuiper belt, a belt of celestial bodies outside the orbit of Neptune.

And sometimes these objects can collide with each other, be deflected by gravity, and then be pulled back into the solar system by Jupiter's gravity.

And they become the comets we see in the sky.

The important thing to note here is that for 4.5 billion years, these comets have been outside our solar system and have not changed. So it's a deeply frozen version of our solar system.

It looks like this in the sky.

We know their tails.

It actually has two tails.

One is the dust tail blown away by the solar wind.

The other is the ion tail, which is a charged particle that follows the magnetic field of the solar system.

There is the coma, then there is the nucleus. It's too small to see here. For Rosetta, we have to remember that the spacecraft is at its center pixel.

We are just 20, 30, 40 kilometers away from the comet.

So what are the important things to remember?

Comets contain the original material from which our solar system was formed, making them ideal for studying the constituents that were present at the beginning of Earth and life.

Comets are also suspected of delivering elements that may have produced life.

In 1983, ESA launched the long-term Horizon 2000 plan. The plan included one basis: a mission to a comet.

In parallel, a smaller mission to the comet, Giotto, seen here, was launched and flew by Halley's Comet in 1986 with a fleet of other spacecraft.

The results of that mission quickly revealed that comets are ideal objects to study in order to understand our solar system.

The Rosetta program was approved in 1993 and was originally scheduled to launch in 2003, but problems arose with the Ariane rocket.

But our public relations department had already produced 1,000 Delft Blue Plates with the wrong comet name in their zeal.

So I didn't have to buy pottery since then. That's the positive part.

(Laughter) After the whole problem was solved, we left Earth in 2004 for the newly elected comet Churyumov-Gerasimenko.

This comet had to be specially selected. Because A, you have to be able to get there, and B, you shouldn't stay in the solar system too long.

This comet has been in the solar system since 1959.

It was the first time it had been so close to the Sun that it had been deflected by Jupiter and began to change.

A very fresh comet.

Rosetta has achieved several historic firsts.

This will be the first satellite to orbit a comet, and it will escort the comet throughout its journey around the solar system - its closest approach to the Sun as we'll see in August, then descent out again.

It will be the first time in history to land on a comet.

It will actually orbit the comet using things that regular spacecraft don't do.

You can usually tell where you are pointing and where you are by looking at the sky.

In this case it is not enough.

We sailed while looking at comet landmarks.

We were able to recognize features such as rocks and craters, which allowed us to know where we were relative to the comet.

And, of course, it is the first solar-powered moon to pass the orbit of Jupiter.

Now, this sounds more heroic than it actually is. Because the technology to use radioisotope heat generators was not available in Europe at the time, there was no choice.

But these solar arrays are big.

This is one wing, not specially selected little people.

they are like you and me

(Laughter) We have two 65-square-meter wings.

Of course, then, when you arrive at the comet, you'll find that placing a 65-square-meter sail near the gas-emitting object isn't always a convenient choice.

So how did we get to the comet?

Because, for Rosetta's scientific purposes, it would have to go very far, four times the distance from the Earth to the Sun, and it would require six times the weight of the entire spacecraft, so it would have to go there at a much higher speed than could be achieved with the fuel.

So what do you do?

Gravity Flyby, Slingshot allows you to pass by a planet thousands of kilometers away at very low altitude and get that planet's speed around the Sun for free.

we did that a few times.

We've flown Earth, we've flown Mars, we've flown Earth twice, and we've flown close to two more asteroids, Lutetia and Steins.

And in 2011, we went into hibernation because we were so far from the Sun that we couldn't actually save the spacecraft if it got into trouble.

All but one clock were switched off.

Here the trajectory and how this works is shown in white.

From the circle we started with, the white line, it actually became more and more elliptical until we finally got close to the comet in May 2014 and had to start the rendezvous maneuver.

On our way there, we flew close to Earth and took a few photos to test the camera.

This is the moon rising above the earth, this is what we now call a selfie. By the way, the word did not exist at that time. (Laughter) It's Mars. Taken with a CIVA camera.

This is one of the cameras on the lander, just looking underneath the solar array, and you can see Mars and the solar array in the distance.

Well, in January 2014, when it awoke from hibernation, it began arriving at a distance of 2 million kilometers from the comet in May.

However, the speed of the spacecraft was too fast.

We were going 2,800 kilometers per hour, faster than a comet, so we had to hit the brakes.

We had to do eight maneuvers, and as you can see some of them were pretty big.

The first brake had to be braked at hundreds of kilometers per hour, and in fact the duration was 7 hours, consuming 218 kilos of fuel and nerve-wracking 7 hours. Because in 2007 there was a leak in Rosetta's propulsion system and the branch had to be closed. So the system was actually operating at pressures it was never designed for or certified for.

We then arrived close to the comet and these were the first pictures we saw.

Since the actual comet has a rotation period of 12.5 hours, this is accelerated, but you can see that the flight mechanics engineers didn't think this would be an easy landing.

We expected some kind of spud that would land easily.

But we had one hope. Maybe things went smoothly.

No, that didn't work either. (Laughter) At that point, it was clearly inevitable. We needed to find a flat area with a diameter of 500 meters, so we had to map this object in as much detail as possible.

why 500 meters? That is the error when landing the spacecraft.

So we went through this process and created a comet map.

We used a technique called light tilting.

Take advantage of the shadows cast by the sun.

Here you can see the rocks on the comet's surface, with the sun shining from above.

From the shadow, our brain can quickly determine what the rock looks like.

It can be programmed by a computer to cover the entire comet and create a map of the comet.

To that end, we have flown a special trajectory since August.

First, at a distance of 100 kilometers, we drew a 100-kilometer triangle and repeated it at the 50-kilometer point.

At the time, we were observing the comet from all angles, and we were able to use this technique to map the entirety.

Well, this led to the selection of the landing site.

The whole process we had to go through, from mapping the comet to actually finding the final landing site, took 60 days.

There were no more.

Imagine, the average Mars mission takes years with hundreds of scientists conferring on where to go.

We had 60 days, but that was it.

We have chosen our final landing site and prepared the command for Rosetta to launch Philae.

How this works is that the lander is passive, so Rosetta has to be at the right point in space and heading towards the comet.

The lander is then pushed out and travels toward the comet.

Rosetta had to turn so that the camera could actually see and communicate with Philae during her departure.

Well, the landing time for all orbits was 7 hours.

Let's do some simple math here. If the speed of Rosetta deviates by 1 centimeter per second, 7 hours equals 25,000 seconds.

So the comet's position is wrong by 252 meters.

So Rosetta's speed needed to be much more precise than a centimeter per second, and it needed to know its position in space more than 100 meters, which is 500 million kilometers from Earth.

It's no big deal.

Let's briefly discuss some science and equipment.

I'm not going to go into detail on every instrument, but it's all there.

We can smell gas, we can measure dust particles, their shape, composition, magnetometers, everything.

This is one of the results from an instrument that measures gas density at the position of Rosetta, the gas emerging from the comet.

The chart below is from last September.

There are long-term fluctuations, not surprising in themselves, but sharp peaks can be seen.

Today is Comet Day.

You can see how the sun affects the evaporation of gas and how the comet rotates.

So apparently there's one place where a lot of matter comes from and heats up in the sun and cools down on the other side.

And you can see this change in density.

These are the gases and organic compounds we have already measured.

I know this is a great list, but there will be more to come as more measurements exist.

In fact, a conference is currently being held in Houston where many of these results have been published.

We also measured the dust.

Now, to you, this may not be very impressive, but scientists were thrilled to see this.

Two dust particles: The particle on the right is called Boris and was tantalum-launched to allow analysis.

Well, we found sodium and magnesium.

Since this indicates that this is the concentration of these two substances at the time the solar system formed, we have learned a thing about which substances were present when the planets formed.

Of course, one of the key factors is imaging.

This is one of Rosetta's cameras, the OSIRIS camera, which actually graced the cover of Science magazine on January 23rd of this year.

No one expected this body to turn out like this.

Rocks, rocks, more like Yosemite's Half Dome.

I've also seen something like this. Dunes and what appear to be windblown shadows on the right.

We know these things from Mars, but the comet has no atmosphere, so making windblown shadows is a little more difficult.

It could be a local gas release, something that rises back up.

I don't know, so I have a lot to look into.

Here the same image is displayed twice.

You can see the hole in the middle on the left.

On the right, if you look closely you can see three jets coming out of the bottom of that hole.

This is cometary activity.

Apparently, there are active regions at the bottom of these pits, where matter evaporates into space.

The comet has a very interesting crack in its neck.

You can see it on the right.

It is 1 kilometer long and 2.5 meters wide.

In fact, some suggest that the comet could split in two as we approach the Sun, and then we would have to choose which comet to target.

Landers -- Again, there's a lot of equipment that's pretty much the same, except for things like hammering into the ground and using drills.

But much like Rosetta, it's because we want to compare what we find in space with what we find on comets.

These are called ground truth measurements.

These are landing descent images taken with the OSIRIS camera.

You can see the lander moving further and further away from Rosetta.

The upper right shows an image taken by the lander 60 meters above the comet's surface.

The rock there is about 10 meters high.

This is one of the last images taken before landing on the comet.

Here the whole sequence is presented again from a different perspective. Three explosions can be seen from the lower left to the center of the lander moving across the comet's surface.

And at the top there are before and after images.

The only problem with afterimages is the lack of landers.

But if you look carefully at the right side of this image, you could see the lander still there, but bounced.

I left again.

Now, on a slightly comical note, Rosetta was originally designed to have a bouncing lander.

I gave up because it was too expensive.

Well, we forgot, but we knew the lander.

(Laughter) During the first bounce, the magnetometer shows data from three axes: x, y, and z.

You can see the red line in the middle.

There is a change at the red line.

Apparently, what happened was that somewhere during the first bounce, one of the lander's legs hit the edge of the crater, changing the rotation speed of the lander.

So we are rather lucky to be where we are.

This is one of Rosetta's iconic images.

It's an artifact, the leg of a lander standing on a comet.

To me, this is one of the best images of space science I've ever seen.

(Applause.) One thing we still have to do is actually find the lander.

The blue area here is where we know it should be.

It has not yet been found, but the search continues, as do efforts to reactivate the lander.

We are listening daily and hope that sometime between now and April the Lander will reawaken.

Discovery of what we found in comets: this one will float on water.

It's half the density of water.

It looks like a very big rock, but it's not.

The increase in activity seen in June, July and August last year was a 4x increase.

By the time we get close to the Sun, the comet will be ejecting gas and dust at a speed of 100 kilometers per second.

That's 100 million kilometers per day.

And finally the day of landing.

I will never forget -- absolute madness, a 250-person German TV crew.

The BBC was interviewing me and another TV crew that had been following me all day was filming me being interviewed and it was like that all day long.

In fact, Discovery Channel staff caught me trying to leave the control room and asked the right questions. And then I burst into tears. I still feel this way.

For a month and a half, I couldn't think about the day of the landing without tears, and the emotion is still with me.

I would like to leave you with the image of this comet.

thank you.

(applause)

I am Hazara and my ethnic homeland is Afghanistan.

Like hundreds of thousands of other Hazara children, I was born in exile.

The ongoing persecution and operations against Hazaras forced my parents to leave Afghanistan.

This persecution has a long history, dating back to the reign of King Abdul Rahman in the late 1800s.

He killed 63 percent of the Hazara population.

He built a minaret with its head.

Many Hazaras were sold into slavery, and many others fled the country to neighboring Iran and Pakistan.

My parents also fled to Pakistan and settled in Quetta, where I was born.

After the Twin Towers attacks on September 11th, I had the opportunity to go to Afghanistan for the first time with a foreign journalist.

I'm only 18 and got a job as an interpreter.

Four years later, I felt safe enough to live permanently in Afghanistan, where I worked as a documentary photographer and worked on many stories.

One of the most important stories I worked on was The Dancing Boys of Afghanistan.

This is a tragic story about a terrible tradition.

It involves young children dancing for warlords and those in power in society.

These boys are often kidnapped or bought by their poor parents and forced to work as sex slaves.

It's shukur.

He was kidnapped from Kabul by warlords.

He was taken to another province, where he was forced to work as a sex slave for the warlords and their friends.

After this article was published in The Washington Post, I began receiving death threats and was forced to leave Afghanistan, along with my parents.

I returned to Quetta with my family.

Things have changed dramatically in Quetta since I left in 2005.

What was once a peaceful haven for the Hazaras has now turned into one of Pakistan's most dangerous cities.

The Hazaras are confined to two small regions and are marginalized socially, educationally and economically.

It's Nadir.

I have known him since I was a child.

He was injured when his van was ambushed by terrorists in Quetta.

He later died from his injuries.

About 1,600 Hazaras were killed in various attacks, of which about 3,000 were wounded, many of them permanently disabled.

With the attacks on the Hazara community only getting worse, it was no wonder that many wanted to flee.

Australia has the fourth largest Hazara population in the world after Afghanistan, Iran and Pakistan.

When it came time to leave Pakistan, Australia seemed the obvious choice.

I decided to go in the hope that financially only one of us would be able to leave, and the rest of the family could join us later once we arrived safely at our destination.

We all knew the dangers and how terrifying the journey was and I have met many people who have lost loved ones at sea.

It was a desperate decision to throw everything away, but no one makes this decision lightly.

If I could fly to Australia, it would have taken less than 24 hours.

However, it was impossible to obtain a visa.

My journey was much longer, much more complicated, and certainly more dangerous. I flew to Thailand, then landed and sailed to Malaysia and then Indonesia, paying people and smugglers all the way and spending a lot of time in hiding in fear of being caught.

In Indonesia, I joined a group of 7 asylum seekers.

We all shared a bedroom in a town called Bogor on the outskirts of Jakarta.

After spending a week in Bogor, three of my roommates set out on a perilous journey. Two days later, we received word that the wrecked boat had sunk on the way to Christmas Island.

It turns out that our three roommates, Nauroz, Jafar and Shabir, were among them.

Only Jafar was rescued.

Shabir and Navros never appeared again.

It made me wonder if what I was doing was right.

I have come to the conclusion that I really have no choice but to continue.

A few weeks later, the smugglers called us to say that the ship was ready and we could begin our voyage.

In the evening on our way to the ship by motorboat, we boarded an old fishing boat that was already overloaded.

There were 93 of us, all below decks.

No one was allowed to climb to the top.

We paid $6,000 each for this portion of the trip.

The first night and day went smoothly, but the weather changed on the second night.

The waves rocked the boats and the timbers groaned.

People below deck remembered their loved ones, wept and prayed.

they were screaming

It was a terrible moment.

It was like an apocalyptic scene, or a scene from a Hollywood movie where everything collapses and the world is about to end.

It was actually happening to us.

We had no hope.

Our boat floated like a matchbox out of control.

The waves were much higher than our boat and the water came in faster than the motor pump could take it out.

We have all lost hope.

We thought it was over.

We were watching our deaths and recording them.

The captain told us that it was too late and that the boat had to be turned back.

We went out on deck and lit and extinguished our torches to attract the attention of passing ships.

We kept trying to get their attention by waving life jackets and whistling.

Eventually, we arrived at a small island.

Our boat hit a rock and I slid into the water, destroying everything I recorded.

But luckily the memory card was safe.

It was a dense forest.

We all split into many groups discussing what to do next.

We were all scared and confused.

And after spending the night on the beach, I found a pier and coconuts.

We picked up a boat from a nearby resort but it was quickly handed over to the Indonesian water police.

At Serang Detention Center, an immigration officer came and secretly stripped us and examined us.

He took our cell phones, $300 in cash, and shoes we weren't supposed to get away with, but we kept an eye on the security guards and checked their movements, and around 4am, when they were sitting around the fire, we removed the two panes of glass from the outside facing window and slipped through.

We climbed a tree next to the outer wall with shards of glass piled up on top.

I put a pillow on top of it, wrapped a sheet around my forearm and climbed the wall, running barefoot.

I was free, but my future was uncertain and I had no money.

All I had was a memory card with photos and videos.

When my documentary aired on SBS Dateline, many friends found out about my situation and tried to help me.

They did not allow me to take other ships to risk my life.

I also decided to stay in Indonesia and handle the case through UNHCR, but I was really afraid that like other asylum seekers, I would not be able to do anything or work in Indonesia for years.

But mine was a little different.

I was lucky.

My contact worked through UNHCR to expedite my case and I was able to resettle in Australia in May 2013.

Not all asylum seekers are as lucky as I am.

It's really hard to live a life in limbo with your destiny uncertain.

Australia's asylum seeker problem has become so politicized that it has lost its human face.

Asylum seekers were demonized and presented to the people.

I hope my story and the stories of other Hazaras can shed some light to tell people how these people are suffering in their homeland, how they are suffering and why they are risking their lives and seeking asylum.

thank you.

(applause)

This is a kindergarten that we designed in 2007.

We made this kindergarten a circle.

It's a kind of endless circulation on the roof.

If you're a parent, you know that kids love to keep the circle going.

The rooftop looks like this.

And why did you design this?

The principal of this kindergarten said, "No, we don't need the handrail."

I said, "That's impossible."

But he insisted, "How about a net sticking out the edge of the roof?"

So that children can catch them falling? ”

(Laughter) I said, "That's not possible."

And, of course, the government official said, "Of course we need handrails."

But you can keep the idea around the tree.

Three trees stick through.

And I was allowed to call this rope a railing.

But ropes, of course, have nothing to do with them.

they fall into the net.

And you can get even more.

(Laughter) Sometimes there are 40 kids around a tree.

The boy on the branch loves trees, so he eats them.

(Laughter) And at events, I sit on the edge.

It looks very nice from below.

monkeys in the zoo.

(laughs) Time to eat.

(Laughter) (Applause) And we got the roof as low as possible. I wanted to see the children on the roof as well as under the roof.

If the roof is too high, only the ceiling will be visible.

And a foot washing place... There are many types of tap water.

I use a flexible tube to spray water on my friends and take a shower, but the one in front is very ordinary.

However, looking at this, the boy is not washing his boots, but is filling them with water.

(Laughter) This kindergarten is fully open most of the year.

And there are no inner and outer boundaries.

So basically this architecture is a roof.

There are also no boundaries between classrooms.

Therefore, there is no acoustic barrier at all.

Putting a lot of children in a quiet box can make some of them very nervous.

But you don't have to be nervous in this kindergarten.

Because there are no boundaries.

And the principal says that if the boy in the corner doesn't want to stay in the room, he will let him go.

It will come back eventually, it will come back because it is a cycle.

(Laughter) But the point is that usually in such cases the children will try to hide somewhere.

But here they just leave and come back.

it's a natural process.

And secondly, we take noise very seriously.

You know that children sleep better in noise.

They don't sleep in quiet spaces.

And in this kindergarten, children show amazing concentration in class.

And as you know, our race grew up in a noisy jungle.

They need noise.

You can talk to your friends even in a noisy bar.

We shouldn't be silent.

And you know, these days we try to keep everything under control.

You know, it's completely open.

And you should know that in winter you can ski even at minus 20 degrees.

I go swimming in the summer.

The temperature of the sand is 50 degrees.

You should also know that it is waterproof.

It does not dissolve in rain.

Therefore, it is assumed that children are outside.

So how should we treat them?

Classrooms are divided like this.

They are supposed to help teachers.

it's not.

(laughs) I didn't let him in.

classroom.

and a washbasin.

They talk to each other around the well.

And there are always trees in the classroom.

A monkey trying to catch another monkey from above.

(laughs) It's a monkey.

(Laughter) And each classroom has at least one skylight.

And it's where Santa Claus comes down at Christmas.

This is the annex right next to that oval kindergarten.

The building is only 5 meters high and has 7 floors.

And, of course, the ceiling height is also very low.

Therefore, safety must be considered.

So we left our children, daughter and son.

they tried to enter.

he hit his head

he's fine His skull is pretty tough.

he is resilient. is my son

(laughter) And he's trying to see if it's safe to jump off.

And then let the other kids in.

As you know, Tokyo has terrible traffic jams.

(laughter) Former driver, she needs to learn how to drive.

Kids these days need a little danger.

And on occasions like this, they learn to help each other.

This is society. This is the kind of opportunity we are losing these days.

Now, this picture shows the boy's movements from 9:10 to 9:30.

And the perimeter of this building is 183 meters.

So it's by no means small.

And this boy ran 6,000 meters in the morning.

But the surprise is yet to come.

Children in this kindergarten run an average of 4,000 meters.

And these children have the highest athletic ability among many kindergartens.

The principal said, "I don't train them. I leave them on the roof."

like sheep. ”

(Laughter) They keep running.

(laughter) What I'm saying is that you don't have to control them, don't overprotect them, and sometimes you have to fall.

they need to get hurt.

And that's what makes them learn how to live in this world.

I believe that architecture has the power to change the world and people's lives.

And this is one of the attempts to change the lives of children.

thank you very much.

(applause)

Today we will talk about anger.

When I was 11, I got angry when I saw my friends leaving school because their parents couldn't afford textbooks.

When I was 27, I was outraged to hear about the plight of a desperate slave father whose daughter was about to be sold to a brothel.

At 50, I was angry that my son and I were lying on the street in a pool of blood.

Dear friends, we have been taught for centuries that anger is bad.

Our parents, teachers, priests, everyone taught us how to control and control our anger.

But why? I ask.

Why can't we transform our anger for the greater good of society?

Why can't we use our anger to challenge and change the evil in the world?

what i tried to do.

Guys, most of the greatest ideas come from anger.

Like when I was 35 and sat in a small jail confined.

All night long I was angry.

But it gave me new ideas.

But we'll get to that later.

Let me start with how I got my name.

I have been a huge fan of Mahatma Gandhi since I was a child.

Gandhi fought and led the Indian freedom movement.

But more importantly, he taught us how to treat the most vulnerable, the most disadvantaged, with dignity and respect.

So, in 1969, while celebrating Mahatma Gandhi's 100th birthday in India, then 15 years old, an idea came to my mind.

Why can't we celebrate differently?

As many of you probably know, I knew that in India many people are born at the bottom of the caste.

And they are treated as untouchables.

These people forget to allow them to go to temples and cannot even enter the houses and shops of high caste people.

There, I was very impressed with the leaders of my town, who spoke out against the caste system and untouchability, and spoke of Gandhi's ideals.

Inspired by that, I decided to set an example by inviting these people to eat food prepared and served by the untouchable community.

I went to the lower caste, the so-called untouchables, and tried to persuade them, but it was unthinkable for them.

They said to me, "No, no, it's impossible. It never happened."

I said, "Look at these leaders, they are so great and against untouchability.

they will come If no one comes, we can lead by example. ”

They thought I was too naive.

Finally they agreed.

My friend and I rode our bikes to invite political leaders.

And I was so excited and even empowered to see each one of them agree to participate.

I thought: "Great idea. I can give you an example.

We can make a difference in society. ”

The day has come.

All these untouchables, three women and two men, agreed to come.

I remember they used the best clothes.

They brought new dishes.

They took hundreds of baths because it was unthinkable for them.

It was a moment of change.

they gathered. the food was cooked.

It was seven o'clock.

By 8 o'clock we continued to wait. It is not uncommon for leaders to be an hour late.

So, after eight o'clock, we rode our bikes to the leaders' homes to remind them.

One of the leaders' wives said to me, "Sorry, he may not be able to come because he has a headache."

I went to another leader and his wife said, "Okay, go, he'll be there."

So, although it's not a very large scale, I thought that a dinner party would be held.

When I returned to the venue, it was the newly built Mahatma Gandhi Park.

It was ten o'clock.

No leader appeared.

It pissed me off.

I was standing leaning against a statue of Mahatma Gandhi.

I was mentally drained and rather exhausted.

I then sat where the food was placed.

I put my feelings on hold.

But when I took my first bite, I broke down crying.

And suddenly I felt a hand on my shoulder.

And it was the healing, maternal touch of an untouchable woman.

And she said to me, "Kailas, why are you crying?"

you did your part.

You ate food made by the Untouchables, but it is never in our memory. ”

“You won today,” she said.

And my friends, she was right.

When I returned home shortly after midnight, I was shocked to see several upper-caste elderly people sitting in the courtyard.

I saw my mother and the elderly women crying and pleading with the elderly as they threatened to banish my entire family.

And you know, banishing a family is the greatest possible social punishment.

Somehow they agreed to punish me only and the punishment was purification.

In other words, he had to travel 600 miles from his hometown to the Ganges to take a divine dip.

And after that I must hold a feast for the priests, and the 101 priests must wash their feet and drink the water.

It was sheer nonsense and I refused to accept the punishment.

how did they punish me?

I was not allowed in my own kitchen or dining room and the dishes were separated.

But the night I got mad they tried to banish me.

But I decided to banish the entire caste system.

(Applause.) That was possible because in India most surnames are caste names, so it should have started with changing your surname.

So I decided to drop the name.

And then I gave myself a new name. Satyarthi means "truth seeker".

(Applause.) That was the beginning of my transformational rage.

My friends, maybe someone can tell me, what was I doing before I became a child rights activist?

does anyone know?

no.

I was an engineer, an electrician.

And I learned how the energy of a burning fire, coal, a nuclear explosion in a room, a raging river, a raging wind, is transformed into light and the lives of millions.

I also learned how the most uncontrollable forms of energy can be harnessed for good and to make society better.

So back to when I got caught in prison. I was very happy to free a dozen children from slavery and hand them over to their parents.

The joy I felt when I released my child is indescribable.

I was very happy

But as I waited for the train back to my hometown of Delhi, I saw dozens of children arriving. They were being trafficked by someone.

I stopped them, those people.

I complained to the police.

So instead of helping me, the police threw me like an animal into this tiny little shell.

And it was the night of rage when one of the brightest, biggest ideas was born.

I wondered if we could continue to release 10 children and 50 more would join us.

And I believed in consumer power. And let me tell you, this is the first time a consumer education and awareness campaign has been launched by me or anywhere in the world to create demand for child labor free rugs.

It has been successful in Europe and America.

And as a result, child labor in South Asian countries has decreased by 80%.

(Applause.) Not only that, but this first-ever consumer power, or consumer campaign, has grown and surpassed other countries and other industries, maybe chocolate, maybe apparel, maybe shoes.

At the age of 11, when I realized how important education is for every child, I came up with the idea to help the poorest children by collecting used books.

I made a book bank when I was 11 years old.

But I didn't stop.

Later, I co-founded the Global Campaign for Education, the world's single largest civil society campaign for education.

It has helped shift the whole way of thinking about education from a philanthropic mode to a human rights mode, specifically helping to halve the number of out-of-school children in the last 15 years.

(Applause.) My 27-year-old anger at freeing a girl who was about to be sold into a brothel gave me the idea to work on a new strategy of raid and rescue to free children from slavery.

And I am very lucky and proud, but it was not one, ten, twenty, my colleagues and I were able to physically free 83,000 child slaves and hand them over to their families and mothers.

(Applause.) We knew we needed a global policy.

We organized a global march against child labour, resulting in a new international treaty to protect children at their worst.

And the tangible result is that the number of child laborers worldwide has fallen by a third over the past 15 years.

(Applause.) So in each case, it started with anger and turned into an idea and then an action.

So angry, what next?

Ideas, and -- Audience: Actions Kailash Satyarthi: Anger, Ideas, Actions. what i tried to do.

It is the law of nature that anger is power, anger is energy, and energy is never created, never extinguished, never destroyed.

So why can't we transform and harness the energy of anger to create a better, more beautiful world, a fairer and more just world?

The anger is inside each of you, sharing secrets for a few seconds. When we are trapped in the narrow shell of the ego and the circle of selfishness, that anger turns into hatred, violence, revenge and destruction.

But if we can break this cycle, that same anger can turn into great power.

We can use our innate compassion to break the cycle and connect with the world through compassion to make this world a better place.

That same anger can be transformed into it.

So, dear friends, sisters and brothers, as a Nobel laureate, I once again invite you to be angry.

I encourage you to get angry.

And the most angry people among us are those who can turn that anger into ideas and actions.

Thank you very much.

(Applause) Chris Anderson: Over the years, you have inspired others.

Who or what inspires you and why?

KS: Good question.

Chris, let me tell you, it's true. Every time I release a child, a child who has lost all hope of coming back to his mother, the first smile of freedom, a mother who has lost all hope that her son or daughter can come back and sit on her lap, they become so emotional that the first tears of joy run down her cheeks. I see a glimpse of God in it. This is my biggest inspiration.

And I am so lucky, as I said before, not once but thousands of times, to witness my God in the faces of those children, and they are my greatest inspiration.

thank you.

(applause)

This is a story about capitalism.

This is a system I love because it has given me and millions of other people success and opportunity.

I started trading commodities, especially cotton, in the pits when I was in my twenties. If there was a free market, it was here. There, men who wore ties and acted like gladiators literally and physically fought for profit.

Luckily, by the time I turned 30, I was competent enough to move upstairs into the world of wealth management, where I spent the next 30 years as a global macro trader.

During that time, I've seen a lot of crazy things on the market and have dealt with a lot of crazy maniacs.

And unfortunately, I have to report that we are currently in what is arguably the most dire situation of my career. And one thing I can say consistently is that Mania never ends well.

Now, over the past 50 years, we as a society have come to have a very narrow, almost monolithic view of how we value our companies and corporations, to the exclusion of all else, with a heavy focus on earnings, short-term quarterly earnings, and stock prices.

It's like the company has been robbed of its humanity.

Now, we don't do that -- like Lego toys, reduce something to a convenient set of numbers to play with -- we don't do that in our personal lives.

We don't treat or evaluate anyone based on their monthly income or credit score, but we have double standards when it comes to how we evaluate businesses.

It threatens the very foundations of our society.

And this is what it looks like.

This chart shows the company's profit margin on sales going back 40 years, at 12.5%, the highest level in 40 years.

Well, if you're a shareholder, hooray, but if you're on the other side of the shareholder and your average American worker, you'll find that's not so good.

[“Proportion of Income Divided to Work in the United States and CEO-to-Employee Compensation Ratio”] Now, higher profit margins do not increase society's wealth.

What they are really doing is exacerbating income inequality, which is not a good thing.

But intuitively it makes sense, right?

Because when America's top 10% of families own 90% of the stock, they will have a larger share of corporate profits, leaving less wealth for the rest of society.

Again, income inequality is not a good thing.

The following chart, produced by The Equality Trust, shows 21 countries, from Austria to Japan to New Zealand.

The horizontal axis is income inequality.

The farther to the right you go, the greater the income inequality.

The vertical axis displays nine social and health indicators.

The higher this number, the worse the problem, and those metrics include life expectancy, teenage pregnancy, literacy, and social mobility, just to name a few.

Now, Americans in the audience may be wondering where America ranks.

where is it on that chart?

And what do you think?

We are literally off the charts.

Yes, we are the ones with the greatest income inequality and the greatest social problems, according to those indicators.

Well, this is macro forecasting made easy. That means the gap between the richest and the poorest will narrow.

History always does.

It usually happens either through revolutions, tax increases, or wars.

None of them are on my to-do list.

(Laughter) Well, there's another way. It is to enhance the fairness of corporate behavior. But the way we currently operate requires a major change in behavior, and like an addict trying to quit a habit, the first step is to admit you have a problem.

And let me just say one thing: this fanaticism for profit that we've fallen into is so ingrained that we don't even realize how we're harming society.

This is a small but amazing example of how we do it. This graph shows corporate giving as a percentage of profit, not revenue, over the last 30 years.

When you put this side by side with the corporate profit margin chart earlier, does that make sense?

In all fairness, when I started writing this, I thought, "Wow, what does our company, Tudor, do?"

And we find that we donate 1 percent of our corporate profits to charity every year.

And I should be a philanthropist.

I literally almost threw up when I realized that.

But the point is, this mania is so entrenched that well-meaning people like myself don't even realize we're a part of it.

Now, we are not going to change corporate behavior just by increasing corporate philanthropy and charitable giving.

Oh, by the way, we quadrupled it after that -- (applause) -- please.

But we can do it by promoting fairer behavior.

And one of the ways we can do that is by actually trusting the system that got us here in the first place: the free market system.

About a year ago, some friends and I founded a nonprofit organization called Just Capital.

Its mission is very simple. To help companies and legal entities learn how to operate in a fairer way by leveraging public opinion to precisely define standards of corporate conduct.

At this time, there are no widely accepted standards that companies and businesses can follow. That's where Just Capital comes in. Because every year, starting this year, we'll be conducting a national survey of a representative sample of Americans to find out exactly what they consider to be the standards of fairness in business conduct.

Well, this is a model that starts in the United States, but can be expanded anywhere in the world. And perhaps the most important thing for our citizens will be to create living wage jobs, to manufacture healthy products, and to help the environment rather than harm it.

At Just Capital we don't know and it's not for us to decide.

We are only messengers, but we have 100 percent confidence in the American people doing things right.

So, in September of this year, we will release our first survey results, and next year we will conduct the poll again, this time taking the extra step of ranking the 1,000 largest U.S. companies from #1 to #1,000 and everything in between.

We call this "Just Index". Remember, we are an open-minded, independent, non-profit organization that gives the American people a voice.

And perhaps over time, as people learn which companies are the most just, they will find that human and financial resources will be concentrated in those companies, which will be the most prosperous and contribute the most to our nation's prosperity.

Today, capitalism has contributed to every major innovation that makes our world a more exciting and livable place.

Capitalism must be based on justice.

Economic divisions are growing by the day, and now more than ever, we have to.

It is estimated that 47 percent of US workers could be displaced over the next 20 years.

I am not against progress.

Like everyone else, I want a self-driving car and a jetpack.

But I want to recognize that as wealth and profits increase, so must corporate social responsibility.

Adam Smith, the father of capitalism, said, "If justice were to be taken away, the great and colossal fabric of human society must collapse into atoms in an instant."

Now, when I was younger, when I had a problem, my mother would always sigh and shake her head and say, "Have mercy, have mercy."

Now is not the time for us or the rest of us to show them mercy.

Now is the time for us to show them fairness. You and I can do that by starting where we work and where we operate.

And when we equate justice with profit, we will have the greatest things in the world.

We will regain our humanity.

thank you.

(applause)

Well, sometimes the most important things come in the smallest packages.

In the remaining 15 minutes, I hope you'll convince everyone that microbes have a lot to say about questions like "Are we alone?"

And they tell us more about life not only within our solar system, but possibly also outside it. That's why I follow them in the most impossible places on earth, extreme environments where conditions really push them to the brink of survival.

In fact, I sometimes chase them too much.

But the thing is, we are the only advanced civilization in our solar system, but that doesn't mean there aren't microbes nearby.

In fact, the planets and moons we see here all have the potential for life, we know it, and we know it's likely.

And if we're going to find life on those moons and planets, we'll answer questions like, are we alone in the solar system?

where do we come from

Do you have family nearby?

Does life exist outside our solar system?

And we can ask all these questions because there has been a revolution in our understanding of what a habitable planet is. Today, habitable planets are planets with zones where water can remain stable. But to me, this is the horizontal definition of habitability. Because it has to do with the distance to the stars. But there is another dimension to habitability, and this is the vertical dimension.

Think of this as the subterranean conditions of a planet where water, energy, and nutrients reside, despite being far from the Sun. They are food and protection for some.

And if you look at the deep-sea Earth, far from the sunlight, life is thriving, and only chemistry is used in life's processes.

So when you think of it at that point all the walls come down.

There are basically no restrictions.

And if you've been watching the recent headlines, you'll see that with Europa, Ganymede, Enceladus, Titan discovering subterranean oceans, and now Enceladus discovering geysers and hot springs, our solar system is turning into a giant spa.

Anyone who has been to a spa knows how much microbes are like that, right?

(Laughter) At that point, think about Mars as well.

There is currently no life on the surface of Mars, but it may still be lurking underground.

So while we are also advancing our understanding of habitability, we are also advancing our understanding of what the signs of life on Earth are.

And then there are what we call organic molecules, these are the bricks of life, fossils, minerals, biominerals, this is from reactions between bacteria and rocks, and of course there can be gases in the atmosphere.

If you look at the tiny green algae on the right side of the slide here, they're the direct descendants of people who pumped oxygen into the Earth's atmosphere a billion years ago.

When they did that they polluted 90 percent of life on the surface of the planet, but they are the reason you are breathing this air today.

But even with all of this understanding, one question still remains unanswered. That's where we came from.

And as you know, things are getting worse. Because we won't find any physical evidence of where we came from on Earth. The reason is that everything older than 4 billion years has disappeared.

All records are erased and lost by plate tectonics and erosion.

This is what I call the Earth's biological horizon.

Beyond this horizon, we don't know where we came from.

So is it all lost? Well, maybe not.

And we may be able to find evidence of our own origins in the most unlikely place: this spot on Mars.

How is this possible?

Apparently, at the beginning of the solar system, Mars and Earth were hit by a giant asteroid and a comet, and the ejecta from that collision were everywhere.

Earth and Mars have been throwing rocks at each other for a long time.

Rock fragments fell to earth.

A piece of Earth has landed on Mars.

It is therefore clear that these two planets could have been seeded with the same material.

Yes, maybe Grandpa is sitting on the ground waiting for us.

But it also means we can go to Mars and try to find traces of our own origins.

Mars may hold its secrets for us.

This is why Mars is special to us.

But for that to happen, Mars needed to be habitable when the conditions were right.

So was Mars habitable?

Today we have many missions to communicate the exact same thing.

At the time life began on Earth, Mars had oceans, volcanoes, lakes, and deltas like the beautiful pictures you see here.

This photo was sent by the rover Curiosity just a few weeks ago.

This shows the remnants of the delta, and something can be seen from this photo. It means that water was plentiful and kept springing up on the surface for a very long time.

This is good news for life.

It takes a long time for life chemistry to actually happen.

This is all very good news, but does it mean that if we go to Mars we will find life easily?

necessarily.

What happened is that when life exploded on the surface of the Earth, literally everything headed south towards Mars.

The atmosphere was stripped away by the solar wind, and Mars lost its magnetosphere, followed by cosmic rays and ultraviolet rays. Attacking the surface, the water fled into space and went underground.

Therefore, if we want to understand and discover traces of life on the surface of Mars, we need to understand how each of these events affected the preservation of that record.

Only then can we know where those traces are hiding, and only then can we send a rover to the right place to sample rocks that might tell us something really important about who we are, or if not, that somewhere else, life independently emerged on another planet.

It's easy to do.

We only need to go back to the planet's past 3.5 billion years ago.

All you need is a time machine.

It's easy?

Well, actually, yes.

Look around you, that's the earth.

This is our time machine.

Geologists use it to go back in time to our planet's past.

I use it a little differently.

I'm using Earth to go to a very extreme environment similar to the conditions on Mars at the time when the climate changed and try to understand what happened there.

What are life signs?

What's left? how do i find it?

So, for a while from now, I'll take you on a journey through the time machine.

And now, as you can see here, we're at 4,500 meters above sea level in the Andes, actually less than a billion years after the formation of Earth and Mars.

Earth and Mars would have looked just like that. There are volcanoes here and there, evaporation lakes here and there, minerals here and there, hot springs here and there. And can you see the hills on the shores of those lakes?

They were built by descendants of the first organisms that gave rise to the first fossils on Earth.

But if you want to understand what's going on, you have to go a little further.

And another peculiarity about these places is that the climate is changing very rapidly, losing water and ice, just like Mars 3.5 billion years ago.

But we need to go back to the days when everything changed on Mars, and to do that we need to go higher.

why is that?

This is because as altitude increases, the atmosphere becomes thinner and more unstable, temperatures are cooler, and UV radiation increases. radiation.

Basically, we are getting to where Mars was when everything changed.

So I didn't promise to take a leisurely trip in a time machine.

You can't sit in that time machine.

We have to carry 1,000 pounds of equipment to the top of a 20,000-foot volcano here in the Andes.

It's about 6,000 meters.

You also have to sleep on a slope with an inclination of 42 degrees and sincerely hope that no earthquake will occur that night.

However, when you reach the top, you can see the lake you are aiming for.

At this altitude, the lake experiences exactly what Mars did 3.5 billion years ago.

And now we have to turn it into an inner journey through that lake. To do that, you have to take off your mountain gear, put on a suit, and take on the challenge.

But when we enter that lake, at the very moment we enter that lake, we will step back 3.5 billion years into the past on another planet, and then we will have the answers to come.

Life is everywhere, absolutely everywhere.

All the objects in this photo are living things.

Not just divers, but maybe everything else.

But this photo is very deceptive.

These lakes are rich in life, but like many places on Earth today, climate change has led to a significant loss of biodiversity.

In the samples we brought back, 36 percent of the bacteria in these lakes consisted of 3 species, and these 3 species are the surviving bacteria so far.

Here is another lake right next to the first lake.

The red color seen here is not due to minerals.

Actually it is due to the presence of small algae.

In this area, UV radiation is really nasty.

Everywhere on Earth, 11 is considered extreme.

In the UV A storm occurs there, and the UV rains down. Index reached 43.

Over there SPF 30 does nothing. The water in the lake is so clear that algae have nowhere to hide. So they develop their own sunscreen. This is the red color you see.

But microbes are only as good as they can get, and when all the water is gone from the surface, microbes have only one solution. Go underground.

And those microbes, the rocks you see here on the slide, actually live inside the rocks, taking advantage of the rocks' translucent protection to capture a good portion of the UV light.

And discard the parts that can actually damage the DNA.

And this is why we are taking rovers to train in these regions to look for life on Mars. Because if life existed on Mars 3.5 billion years ago, it actually had to adopt the same strategy to protect itself.

Now, it's clear that going to extreme environments is very helpful in Mars exploration and mission preparation.

So far, it has helped us understand the geology of Mars.

This has helped us understand not only the past climate of Mars and its evolution, but also its habitability potential.

Mars' newest rover has found traces of organic matter.

Yes, there is organic matter on the surface of Mars.

And traces of methane were also found.

And it is not yet known whether the methane in question is truly of geological or biological origin.

In any case, what we do know is that the hypothesis of life on Mars remains valid today thanks to this discovery.

Now, you can see that Mars is a very special place to us, but it would be a mistake to think that Mars is the only interesting place in the solar system to find potential microbial life.

The reason is that Mars and Earth may have common roots in the tree of life, but beyond Mars it is not so easy.

In celestial mechanics, the exchange of matter between planets is not so easy, so if we did find life on those planets, it would be different from ours.

It will be a different type of life.

But in the end, it could be just us, us and Mars, or the many trees of life in our solar system.

We don't know the answer yet, but one thing we can say is that whatever the outcome, whatever that magic number is, it will give us a yardstick by which we can measure the potential, abundance and diversity of life beyond our solar system.

And this will be achieved by our generation.

This can be our legacy, but only if we have the courage to explore it.

Now, finally, if someone says it's not cool to look for alien microbes because you can't have a philosophical conversation with them, let me explain why and how you can tell them they're wrong.

Well, organic materials teach us about the environment, complexity and diversity.

DNA, or any information carrier, teaches us about adaptation, evolution, survival, planetary change, and information transmission.

All of this tells us what started as microbial pathways and why what started as microbial pathways sometimes ended up as civilization and sometimes as a dead end.

Look at the solar system, look at the earth.

There are many intelligent species on Earth, but only one has achieved technology.

Right here in our journey through our own solar system, there is a very powerful message about how we should look for extraterrestrial life, both large and small.

Yes, the microbes are speaking, we are listening, and they are taking us one planet at a time, one moon at a time, to their brothers there.

And they tell us about diversity, about the richness of life, how this life has survived so far to reach civilization, intelligence, technology, and indeed philosophy.

thank you.

(applause)

Hi. Today we will talk about laughter. I want to start by thinking about the first time I remember noticing laughter.

This was when I was a little girl. I think I was about six years old.

Then I encountered my parents doing something unusual and laughing.

They laughed a lot.

They were lying on the floor and laughing.

They laughed and cried.

I didn't know what they were laughing at, but I wanted to go in.

I wanted to be one of them, so I sat on the edge and said, "Come on!" (Laughter) By the way, what they were laughing at was a song that people used to sing, based on the signs in the train toilets that tell you what you can and can't do in the train toilets.

And the thing to remember about the British, of course, is that we have a very sophisticated sense of humor.

(Laughter) But at the time, I didn't know anything.

I used to just care about laughter, and in fact, as a neuroscientist, I started to care about laughter again.

And that's really weird.

What I'm going to do is act out some examples of real people laughing. And I want you to think about the sounds people make and how strange they are, and how primitive laughter actually is as a sound.

It resembles animal sounds rather than sounds.

So let me introduce you to laughter. I'm pretty happy with the first one.

(Audio: Laughter) Now, next person, I want you to breathe.

There's a part where I'm just thinking, 'I need to get some air, man, it sounds like he's just exhaling'.

(Audio: Laughter) This is not edited. this is him

(Audio: Laughter) (Laughter) And finally, this is a human female laughing.

And laughter can take us to some pretty weird places when it comes to making noise.

(Audio: Laughter) She actually says, "Oh my God, what is that?" in French.

we are all with her. I have no idea.

Now, to understand laughter, we have to look at a part of the body that psychologists and neuroscientists don't usually spend a lot of time looking at: the ribcage. It doesn't seem all that exciting, but in reality, everyone uses rib cages all the time.

What you're doing with your ribcage right now and don't stop doing it, it's breathing.

You use the intercostal muscles, the muscles between the ribs, to move air in and out of your lungs simply by expanding and contracting your rib cage. If you put a strap on the outside of your chest, called a breath belt, and watch it move, you'll see a fairly gentle sinusoidal motion, so that's breathing.

As soon as you start talking, the way you use your breath is completely different.

So what I'm doing now is looking at something very similar to this.

When you speak, you use very fine movements of your ribcage to squeeze the air out. In fact, humans are the only animals that can do this.

That's why I can speak at all.

Well, speaking and breathing have deadly enemies. The enemy is laughter. Because what happens when you smile is that the same muscles start contracting in a very regular way, creating a very pronounced zigzag motion that squeezes air out of your body.

It's literally the basic way to make sounds.

Stomping on someone has the same effect.

You're just squeezing out the air, and with each contraction, Ha! -- make sound.

And when labor goes on at the same time, cramps can occur. And from that moment on, the (wheezing) phenomenon begins to occur.

I am good at this. (Laughter) Now, when it comes to the science of laughter, not so much, but almost everything we think we know about laughter has turned out to be wrong.

So, for example, it's not at all unusual to hear people say that humans are the only animals that laugh.

Nietzsche believed that humans were the only animals that laughed.

In fact, laughter exists in mammals.

This is well described and well observed in primates, but we also see it in mice, and we find it associated with tickling and so on everywhere: humans, primates, mice.

It's the same with humans.

It is associated with play and all mammals play.

And wherever you find it, it's associated with interaction.

Robert Provin, who has done a lot of research on the subject, points out that people are 30 times more likely to laugh when they are with someone than when they are alone, and laughter occurs most in social interactions such as conversations.

Now, if you ask a human being, "When do you laugh?"

They talk about comedy, they talk about humor, they talk about jokes.

Look when they laugh, they are laughing with their friends.

And when we laugh with people, we rarely actually laugh at jokes.

You smile to show people that you understand them, that you agree with them, and that you are part of the same group.

You are smiling to show that you like them.

You might like them too.

You are doing all this at the same time you are talking to them, and laughter has a huge impact on your emotions.

As seen here, what Robert Provine pointed out, and why we laughed when we first heard funny laughter, and why I laughed when I found my parents laughing, is that it is a highly behaviorally contagious effect.

You can catch other people laughing, but you are more likely to catch someone laughing if you know them.

So it is still conditioned by this social context.

Putting humor aside, we have to think about the social meaning of laughter. Because that's where laughter comes from.

Now, what I'm very much interested in is laughter of different kinds. There is some neurobiological evidence about how humans vocalize, suggesting that humans may have two types of laughter.

So it seems that the neurobiology of helplessly unconscious laughter, like my parents lying on the floor yelling about a silly song, might have a different basis than the polite, social laughter you encounter. It's not a bad laugh, but an action someone is doing as part of an interaction with you, as part of an act of communication towards you. they choose to do so.

During our evolution, we have developed two different vocalization methods.

Involuntary vocalizations are part of a system that predates more spontaneous vocalizations like the speech I do now.

So we can imagine that laughter actually has two different roots.

So I investigated further.

To do this, we had to record people laughing, and we had to do whatever it took to make people laugh. And I had the same people produce a more posed, social laugh.

So imagine your friend told a joke. You're laughing because you like your friend, but the joke isn't the only reason.

So let's play some.

Please tell me if you think this laughter is real laughter or if you think it's a show laughter.

So is this unconscious laughter, or more spontaneous laughter?

(Audio: Laughter) How does that sound to you?

AUDIENCE: I posed. Sophie Scott: A pose? A pose.

how about this?

(spoken: laughter) (laughter) I'm the best.

(Laughter) (Applause) No.

No, it was a helpless laugh. In fact, all they had to do to record it was me listening to what one of my friends wanted to laugh at. And I'm just starting it.

It turns out that people are good at distinguishing between real laughter and fake laughter.

Interestingly, we see something very similar in chimpanzees.

Chimpanzees laugh differently when they are tickled than when they are playing with each other. We may be looking at unconscious laughter, ticklish laughter, or something like that, which is different from social laughter.

They are very different sonically.

Real laughter is longer. they have a high pitch.

When you start laughing hard, you start squeezing air out of your lungs at a much higher pressure than you can voluntarily put out.

For example, I couldn't raise my voice that high to sing.

You'll also start hearing these kinds of contractions and weird whistles, but all this means that real laughter is very easy or very easy to spot.

In contrast, a posed laugh might sound a little fake.

Not really, it's actually an important social cue.

We use it a lot and choose to laugh in many situations, but it seems to be its own thing.

For example, the posed laugh, or “hahahahaha” sound, is a sound that can never and cannot be made when laughing involuntarily.

So they actually appear to be of these two different kinds.

We put it into a scanner to see how the brain reacts when it hears laughter.

Doing this would be a really boring experiment.

We just played real people and made them laugh.

We didn't tell them it was a study on laughter.

I put in other sounds to distract them, but they just lay there and listen.

We don't tell them to do anything.

Nevertheless, the brain responds quite differently and significantly differently when hearing actual laughter than when hearing posed laughter.

It's probably true that what you see in the blue area in the auditory cortex is the area of ​​the brain that responds better to actual laughter, but when you hear someone laughing involuntarily, you hear sounds you would never otherwise hear.

It's very clear and seems to be related to better auditory processing of these new sounds.

In contrast, when you hear someone posing and smiling, you see these areas of pink. It occupies an area of ​​the brain associated with mentalization, thinking about what other people are thinking.

What that means is that even if your brain is scanned, even if it's downright boring and not very funny, when you hear someone say "hahahahahaha," you're trying to figure out why they're laughing.

Laughter is always meaningful.

You always try to understand it in context. Even if it doesn't necessarily concern you at the time as far as you are concerned, you still want to know why they are laughing.

Now, we have had the opportunity to explore how people hear real and fake laughter across different age groups.

This is an online experiment that we conducted in collaboration with the Royal Society where we asked people just two questions.

First of all, they heard some laughter and couldn't help but say how real or posed it sounded.

Rapid onset is seen.

As we get older, we get better at finding real laughter.

So a 6 year old has a chance and can't really hear the difference.

Performance improves with age, but interestingly, performance does not peak until the late 30s and early 40s for this dataset.

You won't fully understand laughter until puberty.

You won't fully understand laughter until your brain matures at the end of your teen years.

You have been learning about laughter throughout your early adult life.

If we flip the question and say how much this laughter makes you want to laugh, how contagious this laughter is to you, rather than what that laughter sounds like in terms of whether it's real or posed, we can look at another profile.

And here, the younger you are, the more you want to participate when you hear laughter.

Do you remember laughing with your parents when you had no idea what was going on?

I really understand this.

Now everyone, young and old, finds real laughter more contagious than shown laughter, but as we age, everything becomes less contagious.

Now, maybe we're all just getting really grumpy as we get older, or maybe it's just that as we get better and better at laughter, it's more than just hearing people laugh to want to laugh.

It needs a social element.

So we have a very interesting behavior, and although many layman's assumptions about it are wrong, it turns out that laughter is actually more than an important social emotion that we should pay attention to. Because it turns out that people are surprisingly nuanced when it comes to how they use laughter.

Robert Levenson's lab in California has a really impressive body of work coming out, and he's doing long-term studies with couples.

He took couples, men and women, into the lab and had them have stressful conversations while hooking them up to a polygraph so he could see what they were stressed about.

So put the two in there, and the husband would say to the husband, "Tell me what's bothering you about your wife's behavior."

And what you see right away, you and your partner just have to run it through your head easily, and you can imagine everyone being a little more stressed as soon as it starts.

People are more stressed, as you can see physically.

He found that couples who managed stress with positive emotions like laughter and laughter not only experienced immediate stress relief, but also felt physically better and were found to be coping better with this uncomfortable situation together, were also couples who reported higher relationship satisfaction and stayed together longer.

In fact, when observing intimate relationships, laughter is a very useful indicator of how people control their emotions.

We don't just utter it to each other to show that we like each other, we feel better together.

Now, I don't think this is just about romantic relationships.

This is probably characteristic of intimate emotional relationships, such as with friends. I'll explain in the next clip. This is a YouTube video of some young people from the former East Germany making a video to promote a heavy metal band. Very macho and the atmosphere is very serious. I want you to notice what happens in terms of laughter when things go wrong, how quickly it happens and how it changes the mood.

he is cold he's already getting wet He is wearing swimming trunks and has a towel.

ice.

What could possibly happen?

Video begins.

serious atmosphere.

And his friends are already laughing. They are already laughing.

he's not laughing yet

(Laughter) He's starting to leave now.

And now they are all off.

(Laughter) They're on the floor.

(Laughter) What I really like about this piece is that everything is very serious until he jumps into the ice, and as soon as he's through the ice, there's blood and bones all over the place, and his friends start laughing.

And if it played him standing there and saying, "No, seriously Heinrich, I think this is broken," we wouldn't have enjoyed watching it. It will be stressful.

Or if he's running around laughing with an obvious broken leg and his friends are saying, "Heinrich, I think you need to go to the hospital right now," that wouldn't be funny either.

The fact that laughter works takes him from painful, embarrassing, and difficult situations to funny situations to situations that we actually enjoy. I think this is a really interesting use case, and it happens all the time.

For example, I remember something like this at my father's funeral.

We weren't jumping around on the ice in our pants.

We are not Canadian.

(Laughter) (Applause) Things like this are always difficult. I have relatives who are a bit picky and my mother was not in a good situation. And I remember finding myself just before this story about what happened in a 1970s sitcom started. I just thought then. I don't know why I am doing this. And then I realized what I was doing was that somewhere I came up with something I could use to make her laugh along with me.

It was a very basic reaction to find out why this could be done.

We can laugh together We will overcome this.

No problem.

And in fact we all do this all the time.

We do it so often that we don't notice it.

Everyone underestimates how often they laugh, but when you laugh with people, you're actually doing something. It actually gives mammals access to a very ancient evolutionary system that evolved to build and maintain social bonds, and apparently to regulate emotions and feel better.

This is not unique to humans. This is a very ancient behavior that is very helpful in regulating how we are feeling and making us feel better.

So when it comes to laughter, you and I are just mammals. (laughs) Thank you.

thank you. (applause)

My first love was the night sky.

love is complicated.

You're looking at the Hubble Space Telescope's ultra-deep-field fly-through image. This is one of the most distant images of the Universe ever observed.

All you see here are galaxies made up of billions of stars each.

And the most distant galaxies are a trillion, a trillion kilometers away.

As an astrophysicist, I have the wonderful privilege of studying some of the most exotic objects in the universe.

The objects that have fascinated me throughout my career since the first crash are supermassive, highly active black holes.

With masses between 1 and 10 billion times the mass of our Sun, these galactic black holes are eating matter at more than 1,000 times the speed of the 'average' supermassive black hole.

(Laughter) Those two characteristics and a few others make them quasars.

At the same time, the celestial bodies I study produce some of the most powerful particle streams ever observed.

These narrow streams, called jets, are traveling at 99.99 percent the speed of light and point directly at Earth.

These erupting, Earth-directed, highly active supermassive black holes are called blazers, or flaming quasars.

What makes blazers special is that they are some of the most efficient particle accelerators in the universe, transporting incredible amounts of energy throughout the galaxy.

Here is one artist's blazer concept.

A dinner plate where matter falls into a black hole is called an accretion disc, shown here in blue.

Some of that matter is thrown around the black hole and accelerated to very high velocities in the jet (shown here in white).

Blazer systems are rare, but more common is the process by which nature draws material through a disk and blows some of it away with a jet.

We will eventually zoom out of the Blazer system to show its approximate relationship to the larger galaxy.

Beyond the cosmic explanation of what goes in and what goes out, one of the hot topics in Blazer astrophysics right now is where the highest energy jet emissions come from.

In this image, we are interested in where this white blob forms and whether there is consequently some connection between the jet and the accretion disk material.

A clear answer to this question was almost completely impossible until 2008, when NASA launched a new telescope that could better detect gamma-ray light, light with a million times more energy than a standard X-ray scan.

To more precisely locate these gamma-ray clumps, we simultaneously compare the diurnal and year-to-year variations of the gamma-ray and visible light data.

My research shows that in some cases these clumps form much closer to the black hole than originally thought.

By pinpointing with greater certainty where these gamma-ray clumps are forming, we can better understand how the jets are accelerated, ultimately revealing the dynamic processes that form some of the most fascinating objects in the universe.

This all started as a love story.

And it still is.

This love transformed me from a curious stargazing girl to a professional astrophysicist passionate about discovering celestial bodies.

Who knew chasing space would have me so deeply rooted in my mission here on Earth.

Again, when will we know where our first crush in love really takes us?

thank you.

(applause)

From time immemorial, these dragons are incredible creatures.

They are strange and beautiful, but we know very little about them.

These thoughts crossed my mind when I saw the pages of my first dinosaur book.

I was about 5 years old at the time and decided to become a paleontologist on the spot.

Paleontology has allowed me to combine my love of animals with my desire to travel to remote parts of the world.

And now, years later, I have led several expeditions to the ultimate edge of the planet, the Sahara Desert.

I work in the Sahara Desert because I was on a quest to discover new fossils of a strange, giant carnivorous dinosaur called Spinosaurus.

Several bones of this animal have been found in the Egyptian desert and were described by German paleontologists about 100 years ago.

Unfortunately, all his Spinosaurus bones were destroyed in World War II.

So all that's left is a few pictures and notes.

These paintings show that the creature, which lived about 100 million years ago, was very large, had tall spines on its back, formed a magnificent sail, and had long, narrow jaws similar to those of a crocodile and conical teeth that could have been used to catch slippery prey such as fish.

But for the next 100 years, this was all we knew about the animal.

My fieldwork took me to a place called Kem Kem, the border region between Morocco and Algeria.

It's a difficult place to work.

You have to deal with sandstorms, snakes and scorpions, and finding good fossils there is very difficult.

But our efforts paid off.

We found many wonderful specimens.

It contains the largest dinosaur bones ever found in this region of the Sahara Desert.

Fossils of giant predatory dinosaurs, medium-sized predatory dinosaurs, and seven or eight species of crocodile-like hunters were found.

These fossils were deposited in river systems.

The river system was also home to giant coelacanths the size of cars and the monstrous sawfish, while the skies above the system were full of pterosaurs and flying reptiles.

It's a pretty dangerous place, not the kind of place you'd want to go if you had a time machine.

We're discovering all the amazing fossils of animals that co-existed with Spinosaurus, but Spinosaurus itself turned out to be quite elusive.

We only found fragments, hoping to find a partial skeleton someday.

Finally, just recently, we were able to track down an excavation site where a local fossil hunter uncovered some Spinosaurus bones.

We returned to the scene and collected more bones.

And 100 years later, we finally have another partial skeleton of this strange creature.

And I was able to rebuild it.

We now know that Spinosaurus was very different from other carnivorous dinosaurs and had a slightly crocodile-like head that was very different from Tyrannosaurus.

But the really interesting information came from the remaining skeleton.

We had long spines that formed a large sail.

We had leg bones, we had skulls, we had paddle feet, we had wide feet. This is also very unusual, no other dinosaur has such legs. And we suspect they were used for walking on soft sediments, or perhaps for paddling in water.

We also examined the microstructure of the bones, that is, the internal structure of Spinosaurus bones, and found them to be very dense and dense.

Again, this is found in animals that spend a lot of time in water and helps control buoyancy in water.

We C.T. scanned every bone and built a digital Spinosaurus skeleton.

And when I saw the digital skeleton, I realized that yes, this was unlike any other dinosaur.

It's bigger than Tyrannosaurus, and while it certainly says "eats fish" on its head, it actually has "loves water" written all over its skeleton. It has dense bones, paddle-like feet, and reduced hind limb size. This is also what we see in animals that spend a lot of time in the water.

So, as we fleshed out the Spinosaurus, observing the muscle attachments and wrapping the dinosaur in skin, we realized that we were dealing with a river monster, a predatory dinosaur, much larger than this ancient giant river lord Tyrannosaurus, feeding on many of the aquatic animals we showed you earlier.

That's why this is such an amazing discovery.

A dinosaur like no other.

And some people said to me, 'Wow, this is a once-in-a-lifetime discovery.

The world doesn't have much to discover yet. ”

Well, I don't think anything could be further from the truth.

I believe there are still many treasures in the Sahara Desert. When people say there are no more places left to explore, I like to quote famous dinosaur hunter Roy Chapman Andrews. he said: "There was always adventure around the corner—and the world is still full of horns."

Decades ago, when Roy Chapman Andrews wrote these lines, it was true.

And that is still true today.

thank you.

(applause)

To be honest, I'm not much of a crybaby by nature.

But I think it's been good in my career.

I am a civil rights attorney and have seen terrible events in the world.

I started my career investigating police abuse cases in the United States.

In 1994, I was dispatched to Rwanda as the United Nations genocide investigator.

It turns out that tears don't do much when trying to investigate a genocide.

What I had to see, feel and touch was so indescribable.

All I can tell you is that the Rwandan genocide is one of the world's greatest failures of simple compassion.

The word compassion actually comes from two Latin words. cum passio simply means "to suffer together".

And seeing and experiencing human suffering up close in Rwanda moved me to tears.

But I wish I and the rest of the world had been moved sooner.

And not just to shed tears, but to actually stop genocide.

By contrast, I have also been involved in one of the world's greatest compassionate successes.

And it's a fight against global poverty.

That's probably what all of us here are involved in.

I don't know if your first self-introduction was a chorus of "We Are the World," a photo of a sponsored kid on your fridge door, or a birthday you donated for Mamizu.

I don't quite remember what my first encounter with poverty was, but I do remember it being the most unpleasant.

That's when I met Venus. She is a mother from Zambia.

She has three children and is a widow.

When I met her, she was wearing the only piece of clothing she had and walking about 12 miles to come to the capital to share her story.

She sat with me for hours and just led me into a world of poverty.

She described what it looked like when the coals in the cooking fire finally cooled down completely.

When the last drop of cooking oil is finally gone.

When the last food ran out despite our best efforts.

She had to watch her youngest son Peter become malnourished and his legs slowly crooked and useless.

His eyes were getting cloudier and darker.

And Peter finally got cold.

For more than 50 years, stories like this have moved us with compassion.

We have a lot of food for children.

And we are thrilled that we are not only concerned with poverty in the world, but actually doing our part to stop its suffering.

Now there's a lot of room for criticism that we haven't done enough, and that what we've been doing hasn't been effective enough, but the truth is. The fight against global poverty is perhaps the most pervasive and long-lasting manifestation of the phenomenon of human compassion in the history of our species.

So I'd like to share some pretty shocking insights that might change the way you think about that struggle forever.

But first, let's start with what you probably already know.

Thirty-five years ago, when I was about to graduate from high school, I was told that 40,000 children die every day from poverty.

That number is now down to 17,000.

Too many, of course, but that means 8 million children each year who don't have to die in poverty.

Moreover, the number of people living in extreme poverty (defined as living on about $15 a day) has fallen from 50 percent to just 15 percent worldwide.

This is huge progress and exceeds everyone's expectations of what is possible.

And I honestly think both you and I are proud and encouraged to see that compassion can actually succeed in stopping the suffering of millions of people.

But here's the part you don't hear very often.

Change that poverty mark to just $2 a day and you see that almost the same 2 billion people who were in that grim poverty when I was in high school are still trapped there 35 years later.

So why are billions of people still in such dire poverty?

Now let's think about Venus for a moment.

Now, for decades, my wife and I have been driven by a shared compassion to support our children's sponsorship, microloans and generous levels of foreign aid.

But it wasn't until I actually talked to Venus that I realized that none of these approaches actually mentioned why she had to see her son die.

"We were doing well until Brutus started giving us trouble," Venus told me.

Now, Brutus was Venus' next-door neighbor, and what "caused trouble" happened the day after Venus' husband died, when Brutus came and threw Venus and her children out of the house, stole all the land, and robbed the market stalls.

As you know, Venus was brought to extreme poverty by violence.

And, of course, I knew that neither my children's sponsorships, nor microcredits, nor traditional anti-poverty programs would be able to stop Brutus. because they weren't meant to be.

This became even clearer when I met Griselda.

She is a wonderful young girl who lives in a very poor community in Guatemala.

And one of the things we've learned over the years is that perhaps the most powerful thing you can do to lift Griselda and her family out of poverty is to make sure Griselda goes to school.

Experts call this the Girl effect.

But when we met Griselda, she wasn't in school.

In fact, she hardly left the house.

A few days before we met her, as she was walking home from church with her family, in broad daylight, men from her community snatched her off the street and violently raped her.

You see, Griselda had every chance of going to school, but it wasn't safe for her to go to school.

And it's not just Griselda.

Around the world, poor women and girls aged 15 to 44 are victims of the everyday violence of domestic and sexual violence, and these two forms of violence cause more deaths and disabilities than malaria, road accidents and war combined.

The truth is that the poor of our world are trapped in a whole system of violence.

In South Asia, for example, you could drive past this rice mill and see this man hoisting a 100-pound sack of rice on his thin back.

But I didn't know until later that he was actually a slave and had been subjected to violence in the rice mill since I was in high school.

Decades of anti-poverty programs in his community could not save him and a hundred other slaves from beatings, rapes and violent torture inside the mills.

In fact, half a century of anti-poverty programs have enslaved more poor people than ever in human history.

Some 35 million people are currently in slavery, according to experts.

That's the population of all of Canada where we sit today.

This is why, over time, I have come to refer to this epidemic of violence as the "locust effect."

Because the plague spreads through the lives of the poor and destroys everything.

In fact, if you survey the very poorest communities today, they will say that violence is their greatest fear.

But be aware that the violence they fear is not genocide or war violence, but everyday violence.

So my first reaction as a lawyer was, of course, to think that all the laws had to change.

We must outlaw all this violence against the poor.

But then I realized it already was.

The problem is not that the poor have no access to law, but that they have no access to law enforcement.

In developing countries, the basic law enforcement system has collapsed so much that the United Nations recently released a report stating that "most poor people live outside the protection of the law."

To be honest, neither you nor I have direct experience, so I have no idea what that means.

Whether law enforcement works for us is a complete assumption.

In fact, nothing expresses that assumption more clearly than three simple numbers. 9-1-1 is, of course, the police emergency operator number here in Canada and the United States. The average response time to a police 911 emergency call is approximately 10 minutes.

So we take this completely for granted.

But what if you don't have law enforcement to protect you?

A woman in Oregon recently experienced what this is like.

On Saturday night, when she was alone in her dark house, a man began breaking into her home.

This was her worst nightmare. Because this man had hospitalized her for assault only two weeks ago.

So scared, she picked up the phone and did what we would have done. She called 911. However, she learns that due to budget cuts in her county, law enforcement won't be available on weekends.

listen.

Dispatcher: No one dispatches there.

Woman: OK Dispatcher: Well, if he obviously walks into the mansion and assaults you, can you ask him to leave?

Or do you know if he's drunk?

Woman: I already asked him. I have already told him that I am calling you.

He has broken in before, broke down my door and assaulted me.

Dispatcher: Hmm.

Woman: Well, yes, so...

Commander: Is there a way to safely leave the residence?

Woman: No, I can't. Because he's blocking my only exit.

Commander: Well, all I can do is give advice and call the sheriff's office tomorrow.

Unless, of course, he comes and unfortunately has a weapon or tries to physically harm you.

As you know, the sheriff's office doesn't work over there.

I have no one to send it to. ”

Gary Haugen: Tragically, the woman in that house was violently beaten, strangled and raped. Because this means living outside the rule of law.

And this is where billions of the poorest people live.

what does it look like?

In Bolivia, for example, a man who sexually assaults a poor child is statistically at greater risk of slipping in the shower and dying than going to jail for the crime.

In South Asia, enslaving the poor puts them at greater risk of being struck by lightning than imprisonment for the crime.

And then everyday violence becomes rampant and even more violent.

And it undermines our efforts to save billions of people from $2 a day hell.

Because data doesn't lie.

You have learned that you can give all kinds of goods and services to the poor, but if you do not stop the violent bullies from taking everything away, you will be very disappointed in the long-term effects of your efforts.

You would therefore consider the collapse of basic law enforcement in developing countries to be a very high priority for the global fight against poverty.

But it's not.

An international aid auditor recently failed to find that not one percent of aid is being devoted to protecting the poor from the lawless disruption of everyday violence.

And let's be honest, when we talk about violence against the poor, it's sometimes spoken of in the strangest ways.

The Tamsui group tells the heartbreaking story of girls who were raped on their way to fetch water, then celebrates the resolution of a new well that greatly reduces walking distance.

End of story.

But it doesn't say a word about rapists who still exist in the community.

If a young woman on our college campus were raped on her way to the library, we could never applaud the solution of moving the library closer to the dormitory.

Yet somehow, this is okay for the poor.

In fact, traditional experts in economic development and poverty alleviation do not know how to solve this problem.

So what happens?

they don't talk about it.

But the more fundamental reason law enforcement for the poor in the developing world is so neglected is that people in the developing world who have the money don't need it.

I was at the World Economic Forum a while ago talking to business owners who have large scale businesses in developing countries. I just asked, "How do you protect all people and property from all violence?"

Then they looked at each other and said almost in unison: "We buy it".

In fact, private security forces in developing countries are now four, five, seven times the size of public police.

In Africa, private security firms are now the continent's largest employers.

But look, the rich can pay for security and continue to get richer, while the poor cannot pay for it and are left utterly unprotected and thrown to the ground.

This is a massive and scandalous outrage.

And you don't have to do it this way.

A dysfunctional law enforcement agency can be fixed.

Violence can be stopped.

Almost all criminal justice systems are initially broken and corrupt, but can be transformed through hard work and dedication.

The path forward is really clear.

First, we must make stopping violence an integral part of the fight against poverty.

In fact, any conversation about world poverty that does not include the issue of violence should be considered less serious.

And second, we must seriously invest resources and begin sharing expertise to help developing countries build new public, not private, justice systems that give everyone a chance at safety.

These changes are indeed possible and are happening today.

The Gates Foundation recently funded a project in the Philippines' second largest city. The project enabled local advocates and local law enforcement to transform corrupt police forces and broken courts, significantly reducing commercial sexual violence against poor children by 79% in just four short years.

You know, when you look back at history, the most inexplicable and inexcusable thing is always the simple failure of compassion.

Because I think history convenes the courts of our grandchildren and they just ask us, "Grandpa, Grandma, where have you been?"

Where were you, Grandpa, when the Jews were fleeing Nazi Germany and being rejected from our shores?

where were you

So Grandma, where were you when you were marching your neighbors to the internment camps?

And Grandpa, where were you when your African-American neighbors were beating them up just because you were trying to register to vote? ”

Similarly, when our grandchildren ask us, "Grandpa, Grandma, where were you when the two billion poorest people in the world were drowning in the lawless chaos of daily violence?"

We hope we can be compassionate, speak up, and say that as a generation we are moved to stop violence.

thank you very much.

(Applause) Chris Anderson: Really strong statement.

Tell me a little bit about what's actually going on to promote police training, for example.

How difficult is the process?

GH: Well, one of the great things that's starting to happen is that the collapse of these systems and the consequences are becoming apparent.

Indeed, there is now the political will to do so.

But it now requires an investment of resources and a transfer of expertise.

Struggles for political will will be fought as well, but they are battles that can be won because we have set some very encouraging examples around the world with our international mission for justice.

CA: So how much would it cost to make a significant change in, say, the police in a country? I know it's only part of the story.

GH: For example, in Guatemala, we have started a project to work with local police, courts and prosecutors to retrain them to be effective in real-world cases.

And we've seen a more than 1,000 percent increase in prosecutions for perpetrators of sexual violence.

Funding for this project is very modest at around $1 million a year, and can reap substantial returns in terms of tapping into a functioning criminal justice system if properly trained, motivated, and guided. I think there is an opportunity and a window for change in these countries, especially the middle class who believe there is really no future in this total instability and total privatization of security.

CA: But to make this happen, we have to look at each part of the chain. Police, who else?

GH: That's the story of law enforcement, starting with the police, they're the front line of the justice pipeline, but sometimes the police turn it over to the prosecution, and the prosecution turns it over to the courts. And victims of violence must be supported by social services all the while.

So we need to take an approach that integrates them all.

There's been a bit of courtroom training in the past, but the courts are about getting crappy evidence from the police, or a little police intervention related to drugs or terrorism, but nothing to do with the treatment of the poor in general by good law enforcement. So it's important to bring it all together so that people in really poor neighborhoods can experience law enforcement like ours. It's certainly imperfect in our own experience, but hey, isn't it nice to call 911 and feel like someone might protect you? you.

CA: Gary, I think you've done a great job with your book and bringing this to the attention of the world here today.

thanks so much.

Gary Hogen.

(applause)

Roy Gould: Less than a year from now, the world will celebrate the International Year of Astronomy, marking the 400th anniversary of Galileo's first look into the night sky with his telescope.

In a few months, the world will also celebrate the announcement of new inventions by Microsoft Research. I think this invention will have as profound an impact on how we see the universe as Galileo did four centuries ago.

It's called the Worldwide Telescope, and we'd like to thank TED and Microsoft for allowing us to bring this to your attention.

And if you get the chance, I'd love for you to take a closer look at the TED Lab downstairs.

Worldwide Telescope takes the best images from the world's largest telescopes on Earth and in space and seamlessly weaves them together to create a holistic view of the universe.

I think it will change the way we do astronomy, the way we teach astronomy, and most importantly, the way we see ourselves in the universe.

If we were having this TED meeting in our grandparents' time, it might not be such a big deal.

For example, in 1920, drinking alcohol was prohibited. If you were a woman, you weren't allowed to vote. If you look up at the stars and the Milky Way on a summer night, you'll see the entire universe.

In fact, the director of the Harvard University Observatory at the time had a great debate claiming that the Milky Way galaxy is the entire universe.

Harvard made a big mistake. (Laughter.) Of course, we know today that galaxies extend far beyond our galaxy.

We can travel to the farthest reaches of the observable universe, far back in time, to the moment of the Big Bang itself.

We can see the entire spectrum of light, revealing a previously unseen world.

We see these magnificent star nurseries where nature has somehow arranged the right number and size of stars for life to emerge.

We see alien worlds and alien solar systems, there are now 300 of them and they are still growing, but they are nothing like us.

At the center of our galaxy, the Milky Way, and elsewhere in the universe, there are black holes where time itself seems to stand still.

But until now, I think our cosmology has been fragmented and fragmented, and many of the wonderful stories that nature has to tell us have fallen through the cracks. And that is changing.

I would like to briefly mention three reasons why my colleagues in astronomy and education and I are so excited about the Worldwide Telescope, and why I think it is truly transformative.

First, you will be able to experience the universe. For me, the Worldwide Telescope is a kind of magic carpet that allows you to navigate the universe wherever you want to go.

Second, you can tour the universe with an astronomer as your guide.

And I'm not talking here about professionals who just tell you what you're seeing, but about real people who are passionate about different corners of the universe and who can share that enthusiasm and make the universe a welcoming place.

And third, you can create your own tours. You can share tours with friends or create them together. I think this is the part I'm most excited about. Because I think we are all storytellers at heart.

And through storytelling, each of us makes sense of the universe in our own unique way.

We will have a personal world.

I think we're going to see a community of storytellers evolve and emerge.

Before I introduce you to the people responsible for Worldwide Telescopes, I'd like to leave you with this quick thought. When you ask people, "How does the night sky make you feel?"

They often say, "Oh, I'm tiny. I feel tiny and insignificant."

Yes, our gaze is full of space.

And thanks to the creators of the Worldwide Telescope, we can now begin a dialogue with the universe.

If you look at the World Telescope, you will see that we may be small, but we are truly, amazingly important.

thank you.

(Applause.) Words cannot express how honored it is to introduce Curtis Wong from Microsoft. (Applause) Curtis Wong: Thank you, Roy.

What you're seeing here is a great presentation, but it's a tour.

And actually this tour is a tour made before.

All tours are fully interactive, so if you're going somewhere...

When watching a tour, you can pause or look up other information anywhere along the way. There are many websites and sources of information about places to visit. You can zoom in and out.

The entire resource is available.

So Microsoft -- this is a project -- the Worldwide Telescope is dedicated to our colleague Jim Gray, and a lot of his work is what makes this project possible.

This is a labor of love for us and our small team, and we sincerely hope that this will inspire children to explore and learn about space.

Basically, children of all ages are just like us.

And the World Wide Telescope will be available this spring.

It's a free download -- thanks Craig Mundie -- and will be available on the website WorldwideTelescope.org. This is new.

So what you see today is less than 1% of what's here. The TED Lab has a socks-off tour created by a 6-year-old named Benjamin. (laughs) See you there again. thank you.

(applause)

As a child, I didn't always understand why my parents forced me to follow the rules.

Why did you really have to mow the lawn?

Why was homework really important?

Why can't you put jelly beans in oatmeal?

There were many such questions in my childhood.

The normals of childhood, and the realization that sometimes it's best to listen to your parents, even when you don't quite understand why.

It's not that they didn't want me to think critically.

Their upbringing has always sought to reconcile the tension between us siblings understanding the realities of the world while never accepting the status quo as inevitable.

I have found this to be a very purposeful form of education in itself.

One of my favorite educators, Brazilian author and scholar Paulo Freire, speaks very clearly about the need to use education as a tool for critical awakening and shared humanity.

In his most famous book, The Pedagogy of the Oppressed, he said, "No one can become a true human being as long as he prevents others from becoming human."

I've been thinking a lot about this human nature lately. In particular, I think about who is privileged to be recognized as fully human in this world.

Over the past few months, the world has watched unarmed black men and women take their lives at the hands of police and vigilantes.

These events and everything that followed reminded me of my own childhood and the decisions my parents made regarding raising a black boy in America.

I wonder how hard and how unfair it felt to them that they felt they had to strip away parts of my childhood just so I could come home at night.

For example, I remember when I was about 12 years old, on an overnight excursion to another city, one night my friends and I purchased a Super Soaker, turning a hotel parking lot into our own water-filled battle zone.

We hid in the back of the car, driving through the darkness lying between the streetlights, the sidewalks filled with endless laughter.

Within ten minutes, however, my father came out, grabbed my forearm, and dragged me into the room with unfamiliar gestures.

Before I say anything, tell him how stupid you made me look in front of my friends. He mocked me for being so naive.

He looked me in the eye for fear of eating his face out and said, "Son, I'm sorry, but I can't act like my white friends.

You can't pretend to shoot a gun.

You can't run around in the dark.

You can't hide with anything other than your own teeth. ”

I know now how frightened he must have been that someone would mistake all this water for a valid reason, how easily I would fall into the darkness of the night.

These are the kinds of messages I have been bombarded with throughout my life. Keep your hands in constant sight, don't move too quickly, and remove the hood when the sun goes down.

My parents raised me and my siblings in an armor of advice, a sea of ​​alarm bells, lest someone steal the breath from our lungs and create memories on this skin.

So that we can be children instead of coffins and concrete.

And it wasn't because they thought we were better than everyone else, it was just because they wanted us to live.

All my black friends grew up with the same message, the lecture given to us when we were old enough to be mistaken for a nail in the ground and people treated our melanin as synonymous with something to fear.

But what does it mean for children to grow up knowing they can't just be children?

The whims of adolescence are too dangerous to breathe, you can't afford to be just curious, you can't afford to make mistakes, maybe not waking up in the morning is someone's unspoken prejudice.

But it shouldn't define us.

Because I have parents who have raised me to understand that our bodies are not for bullets, but for flying kites, jumping rope, and laughing until our bellies explode.

We had teachers who taught us how to raise our hands in class, not just to signal surrender, and that the only thing we had to give up was the idea that we weren't worthy of this world.

So when we say black lives matter, it's not because other people don't matter, but because when many things tell us otherwise, we have to fearlessly affirm that we deserve to exist.

I want to live in a world where my son is not guilty the moment he is born and the toy in his hand cannot be mistaken for something else.

And I do not accept that this world cannot be built into something new, a place where a child's name does not have to be written on a T-shirt or tombstone, a place where the value of someone's life is determined by nothing but the fact that they have lungs, and where each of us can breathe.

thank you.

(applause)

I am a plant geneticist.

I am researching genes that make plants resistant to disease and stress.

In recent years, millions of people around the world have come to believe that there is something evil about genetic modification.

Today, I would like to introduce it from a different perspective.

First, let me introduce my husband, Raul.

he is an organic farmer.

On his farm he plants a variety of crops.

It's one of the many green farming practices he uses to keep his farm healthy.

Imagine some of the reactions we get. "Really? Are you an organic farmer and a plant geneticist?"

Can you agree on anything? ”

We have the same goal, so it is possible and not difficult.

We want to help feed a growing population without further damaging the environment.

I believe this is the greatest challenge of our time.

Now, genetic modification is nothing new. Virtually everything we eat is genetically modified in some way.

Here are some examples.

On the left is a statue of the ancient ancestor of modern maize.

You can see a single grain roll wrapped in a hard case.

Teosinto is not suitable for making tortillas unless you have a hammer.

Well, let's take a look at the ancient ancestors of bananas.

I see big seeds.

And unappetizing Brussels sprouts and eggplant, so beautiful.

Well, breeders have used a variety of genetic techniques over the years to create these breeds.

Some of them are quite creative, such as using a process called grafting to mix two different seeds to create this variety that is half tomato and half potato.

Breeders also use other types of genetic techniques, such as random mutagenesis, which induces uncharacteristic mutations in plants.

The rice in the cereals that many of us feed our babies was developed using this approach.

Breeders now have more options.

Some of them are very accurate.

I would like to give some examples from my own work.

I am working on rice, the staple food of more than half of the world's population.

Each year, 40 percent of potential yield is lost to pests and disease.

For this reason, farmers plant varieties of rice that have resistance genes.

This approach has been used for nearly 100 years.

But when I entered graduate school, no one knew what these genes were.

It wasn't until the 1990s that scientists finally figured out the genetic basis for resistance.

My lab has isolated immunity genes against very serious bacterial diseases in Asia and Africa.

It turns out that the gene can be incorporated into conventional rice cultivars, which are normally susceptible to infection. You can see that the bottom two leaves are very resistant to infection.

Now, the same month my lab published its findings on the rice immune gene, my friend and colleague Dave McKill stopped by my office.

"Seventy million rice farmers are having trouble growing rice," he said.

That's because the fields are flooded and rice farmers live on less than $2 a day.

Rice grows well in standing water, but most varieties will die if submerged in water for more than three days.

The flood problem is expected to become more serious as the climate changes.

He told me that graduate student Kenong Xu and himself are researching ancient varieties of rice with amazing properties.

It can even withstand two weeks of complete submersion.

He asked if I could help isolate this gene.

I answered yes. We were very excited because we knew that if we were successful, we could help millions of farmers grow rice even when their fields were flooded.

Kenong spent ten years searching for this gene.

Then one day he said, "Come and see this experiment. Please take a look."

When we went to the greenhouse, we found that the conventional cultivar that had been submerged for 18 days had died, but the cultivar called Sub1, which was genetically modified with the new gene we discovered, was alive.

Kenong and I were surprised and excited that just one gene could have such a dramatic effect.

But this is just a greenhouse experiment.

Can this be used in the field?

Here is a 4-month time-lapse video taken at the International Rice Research Institute.

Breeders there used another genetic technique called precision breeding to develop rice varieties with the Sub1 gene.

The left side is the Sub1 variety, and the right side is the conventional variety.

Both varieties grow well at first, but then the fields are flooded for 17 days.

We can see that the Sub1 variety is superior.

In fact, it produces 3.5 times more grain than conventional varieties.

I love this video because it shows the power of plant genetics to help farmers.

Last year, 3.5 million farmers grew sub-1 rice with the help of the Bill & Melinda Gates Foundation.

(Applause.) Thank you.

Currently, many people do not care about genetic modification when it comes to moving rice genes, moving rice genes into rice, or even mixing seeds by grafting or random mutagenesis.

However, when it comes to taking a gene from a virus or bacterium and putting it into a plant, many people say, "That's not true."

why would you do that?

The reason is that it is potentially the cheapest, safest and most effective technology for enhancing food security and promoting sustainable agriculture.

Here are three examples.

Let's take a look at papaya first. it's delicious, is not it?

But now look at this papaya.

This papaya is infected with papaya ring spot virus.

In the 1950s, the virus nearly wiped out papaya production on Oahu, Hawaii.

Many believed that Hawaiian papaya was doomed to extinction, but local Hawaiian plant pathologist Dennis Gonsalves decided to use genetic engineering to combat the disease.

He took a piece of viral DNA and inserted it into the papaya genome.

This is similar to how humans get vaccinated.

Well, let's take a look at his field trials.

You can see the genetically modified papaya in the center.

I am immune to infections.

Conventional papaya on the outside is heavily infected with viruses.

Denise's pioneering work is credited with saving the papaya industry.

Twenty years later, there is still no other way to control the disease.

There is no organic way. There is no traditional method.

80% of Hawaiian papaya is genetically modified.

Now, while some of you may still be a little unsure about viral genes in food, consider the following. Genetically modified papaya contains a small amount of virus.

When you chew a virus-infected organic or conventional papaya, you chew ten times more viral proteins.

Well, look at this pest that eats eggplant.

The brown you see is the frass, which comes out of the insect's posterior end.

To control this serious pest, which can wreak havoc on Bangladesh's entire eggplant crop, Bangladeshi farmers sometimes apply insecticide two to three times a week, or even twice a day when pest pressure is high.

But we do know that some pesticides are extremely harmful to human health, especially when farmers and their families cannot afford adequate protection like these children.

An estimated 300,000 people die each year in developing countries from pesticide misuse and exposure.

Scientists from Cornell University and Bangladesh have decided to fight the disease using genetic technology based on an organic farming approach.

Organic farmers like my husband Raul spray a bacteria-based pesticide called B.T.

This insecticide is highly specific to the pest caterpillars and is practically non-toxic to humans, fish and birds.

Less toxic than table salt.

However, this approach does not work well in Bangladesh.

This is because these insecticidal sprays are difficult to find, expensive, and do not prevent insects from infesting your plants.

In the genetic approach, scientists excise the gene from the bacterium and insert it directly into the eggplant genome.

Will this help reduce pesticide spraying in Bangladesh?

absolutely.

Last season, farmers reported being able to reduce their pesticide use significantly, almost to zero.

They can be harvested and replanted for the next season.

Well, I've given you some examples of how genetic engineering can be used to fight pests and diseases and reduce the amount of pesticides we use.

A final example is how genetic engineering can be used to reduce malnutrition.

Half a million children go blind each year in developing countries due to vitamin A deficiency.

More than half will die.

For this reason, scientists supported by the Rockefeller Foundation genetically engineered golden rice to produce beta-carotene, a precursor of vitamin A.

This is the same pigment found in carrots.

Researchers estimate that just one serving of golden rice a day could save the lives of thousands of children.

However, golden rice is strongly opposed by anti-GMO activists.

Just last year, activists broke into and destroyed a field test site in the Philippines.

When I heard about the destruction, I wondered if they knew they were destroying more than just scientific research projects, they were destroying medical supplies so desperately needed to protect the eyesight and lives of our children.

Some of my friends and family still worry, "How do we know if the genes in food are safe to eat?"

He explained that genetic engineering, the process of transferring genes between species, has been used for over 40 years in wine, medicine, plants and cheese.

During that time, there has not been a single incident of harm to human health or the environment.

But I say, look, I'm not asking you to believe me.

Science is not a belief system.

My opinion doesn't matter.

Let's see the evidence.

After two decades of careful research and rigorous peer review by thousands of independent scientists, all major scientific bodies around the world have concluded that crops currently on the market are safe to eat and that the genetic modification process is no more dangerous than older genetic modification methods.

These are the very same organizations most of us trust on other important scientific issues, such as global climate change and vaccine safety.

Raul and I believe that instead of worrying about the genes in our food, we should focus on how we can help our children grow up healthy.

We must ask whether farmers in rural areas can thrive and whether everyone can afford food.

We must try to minimize environmental degradation.

My biggest fear about loud debates and misinformation about plant genetics is that the vague fears and prejudices of those who have enough to eat could deny access to the technology to the poorest people who need it most.

We have a big challenge ahead of us.

Celebrate scientific innovation and capitalize on it.

It is our responsibility to do all we can to alleviate human suffering and protect the environment.

thank you.

(Applause.) Thank you.

Chris Anderson: I made a strong case.

My understanding is that the core of the GMO opponents comes from two things.

The first is complexity and unexpected results.

Nature is an incredibly complex machine.

If we put out a brand new gene that we created, unchallenged by years of evolution, and it started to mix with other genes that are happening right now, wouldn't that potentially cause some sort of cataclysm and problems, especially if some companies added a commercial incentive to have them put out there?

The concern is that these incentives mean that decisions are not based purely on scientific grounds, and even if they are based on scientific grounds, there are unintended consequences.

How do we know that there is no great risk of unintended consequences?

When we tamper with nature, we often have large unintended consequences and chain reactions.

Pamela Ronald: Now on the commercial side, one thing that is very important to understand is that in the developed world, US farmers, almost all farmers, buy seed produced by seed companies, whether organic or conventional.

So while there is definitely a commercial interest in selling seeds in bulk, I hope that we are selling seeds that farmers will want to buy.

It's different in developing countries.

Farmers there can't afford to buy seeds.

This species is not for sale.

Free availability of seeds in developing countries is very important as these seeds are freely distributed through traditional types of certification bodies.

CA: Aren't some activists saying this is actually part of a conspiracy?

This is the heroin strategy.

Are you going to plant a seed and people will be forever obsessed with it?

PR: Yes, there are many conspiracy theories, but they don't work that way.

For example, seeds being distributed, flood-tolerant rice, which is freely distributed through seed certification bodies in India and Bangladesh, so there is no commercial interest whatsoever.

Golden Rice was developed with the support of the Rockefeller Foundation.

This is also being distributed for free.

There is no commercial benefit in this situation.

Now to answer another question about genetic mixing, won't it have unintended consequences?

Sure, every time we do something different there are unintended consequences, but one of the things I was trying to say is that we've been doing some kind of crazy things to plants, like mutagenesis with radiation and chemical mutations.

This induces thousands of uncharacterized mutations and carries an even higher risk of unintended consequences than many state-of-the-art methods.

It is therefore very important not to use the term GMO as it is scientifically meaningless.

I feel it is very important to talk about specific crops and specific products and think about consumer needs.

CA: So part of what's going on here is that there's a mental model in a lot of people that nature is natural, pure and pristine, and that it's Frankensteinian to tinker with it.

I think you're saying that it makes for something purely dangerous in a way, and that the whole model just misunderstands the way nature works.

Nature is a much more chaotic interplay of genetic changes that is happening all the time anyway.

PR: Absolutely, there is no such thing as pure food.

This means that eggplants cannot be sprayed with pesticides or genetically modified, but then you will be eating frass.

So there is no purity there.

CA: Thank you, Pam Ronald. was strongly argued.

PR: Thank you. I appreciate it

(applause)

Isadora Duncan -- (music) -- A crazy long-legged woman from San Francisco who was fed up with the country and wanted to leave.

Isadora was famous for hanging blue curtains around 1908. She stood with her hand on her plexus and waited, waited, and moved.

(music) Josh, me and Somi call this piece "Red Circles and Blue Curtains".

red circle.

blue curtains.

But this is not the beginning of the 20th century.

This is one morning in Vancouver in 2015.

(music) (singing) Come on, Josh!

(music) (song) Go!

Have you arrived yet?

i don't think so.

Huh, that's right!

(music) What time is it now?

(music) Where am I?

Josh.

Finnish.

Bill T.

Josh.

Finnish.

Bill T.

(Applause.) Yes, yes!

I work with many mathematicians, philosophers, and computer scientists, and I especially sit and think about the future of machine intelligence.

Some people think some of these things are sci-fi, surreal and crazy.

But I want to say, "Okay, let's look at the human situation today."

(Laughter) This is normal.

But come to think of it, our species is actually a recent guest on this planet.

If the earth was created one year ago, humans would have been born ten minutes ago.

The Industrial Age started two seconds ago.

Another way to look at this is to think of world GDP over the last 10,000 years. I actually plotted this on a graph.

It is like this.

(Laughs) It's a strange shape for normal conditions.

I certainly don't want to sit down.

(Laughter) Let's ask ourselves what is causing this current anomaly.

Some would say it's technology.

Indeed, technology has accumulated throughout human history. And now technology is advancing very rapidly. That's the direct cause and that's why we're so productive right now.

But I would like to go back further and consider the ultimate cause.

Look at these two very prominent gentlemen. There's Kanzi -- he's mastered 200 vocabulary tokens. This is an incredible feat.

And Ed Witten unleashed a second string revolution.

If you look under the hood, you'll see basically the same thing.

One is a little bigger and the exact method of wiring may also have some tricks.

But we're only 250,000 generations from our last common ancestor, so these invisible differences aren't all that complicated.

We know that the evolution of complex mechanisms takes a long time.

So, with relatively minor changes, we went from Kanzi to Witten, from broken tree branches to intercontinental ballistic missiles.

So it seems quite obvious that everything we have achieved, everything we care about, depends critically on relatively small changes in the human mind.

And as a corollary, any further change that could profoundly alter the foundations of thought could have potentially huge consequences.

Some of my colleagues believe that we are on the verge of something that could cause a profound change in its underpinnings: machine superintelligence.

Artificial intelligence used to be about putting commands in boxes.

There will be human programmers who painstakingly craft knowledge items.

Building these expert systems served some purposes, but they were very fragile and could not be scaled.

Basically, you get what you put in.

Since then, however, a paradigm shift has occurred in the field of artificial intelligence.

Machine learning is currently underway.

So rather than craft knowledge representations and features, we often create algorithms that learn from raw perceptual data.

It's basically the same as a human infant.

The result is that A.I. is not limited to one domain. On the same system you can learn to translate between any language pair or learn to play any computer game on the Atari console.

Now, of course, A.I. is still a long way from strong cross-domain capabilities that learn and plan in the same way humans do.

There are still some algorithmic tricks in the cerebral cortex that we don't yet know how to match by machine.

So the question is, how far are we from being able to match those tricks?

A few years ago, we surveyed some of the world's leading AI companies. So one of the questions we asked was, "By what year do you think we have a 50% chance of reaching human-level machine intelligence?"

Human level is defined here as the ability to perform almost any task at least as well as an adult, i.e., the actual human level, not just within a limited domain.

And the median answer was 2040 or 2050, depending on exactly which group of experts you asked.

Well, it could happen much later, or even sooner, but the truth is, no one knows.

What we do know is that the ultimate limits of information processing on mechanical substrates are well outside those of biological tissues.

This comes down to physics.

A biological neuron probably fires 200 times per second at 200 Hertz.

But even today's transistors work at gigahertz.

Neurons propagate slowly within their axons, at 100 meters per second.

But in computers, signals travel at the speed of light.

There are also size limitations, such as the human brain must fit inside the skull, but the size of a computer can be more than a warehouse.

So, just as atomic power has been dormant throughout human history, waiting patiently until 1945, the potential for superintelligence is dormant in matter.

In this century, scientists may learn to awaken the power of artificial intelligence.

And then I think an explosion of intelligence might happen.

Now, when most people think about what is smart and what is stupid, I think they have roughly the following image in their minds.

So on one end you have the village fools and on the other end you have Ed Witten or Albert Einstein or your favorite guru.

But from an artificial intelligence perspective, I think the real picture is probably something like this: AI starts with zero intelligence at this point, and then, after years of hard work, will probably eventually reach mouse-level artificial intelligence. This is something that can navigate cluttered environments in the same way as a mouse.

And after years of hard work and heavy investment, we may eventually reach chimpanzee-level artificial intelligence.

And after many more years of really, really hard work, the village stupid artificial intelligence is complete.

And a few minutes later we were over Ed Witten.

The train does not stop at Humanville Station.

Rather, it is highly likely that you will pass by in no time.

This has significant ramifications, especially when it comes to power issues.

Chimpanzees, for example, are strong - for each pound, chimpanzees are about twice as strong as healthy human males.

Yet the fate of Kanji and his companions will depend more on the actions of us humans than on the actions of the chimpanzees themselves.

When a superintelligence emerges, the fate of humanity may depend on what that superintelligence does.

please think about it. Machine intelligence is the last invention humans will ever need to make.

Machines will then be better at inventing than we are, and will invent on a digital timescale.

What this means is basically the telescope of the future.

Think of all the crazy technologies imaginable that humanity could possibly have developed over time. Cure for aging, colonization of the universe, self-replicating nanobots, uploading minds to computers, all sorts of sci-fi yet consistent with the laws of physics.

All this superintelligence could possibly develop very quickly.

Now, superintelligents this technologically mature are very powerful and, in at least some scenarios, they can get what they want.

Then we will have a future shaped by this AI preference.

A good question here is, what is that preference?

Here's where things get even more awkward.

To move forward with this, we must first avoid anthropomorphism.

And this is ironic. Because every newspaper article about the future of AI, I think what we have to do is think about the problem more abstractly and not in terms of Hollywood's vivid scenarios.

We must think of intelligence as an optimization process, a process that guides the future toward a particular configuration.

Superintelligence is a very powerful optimization process.

They are very good at using the means available to them to reach their desired state.

This means that there is no necessary relationship between advanced intelligence in this sense and having goals that we humans find worthy or meaningful.

Suppose you give AI. The goal is to make people smile.

If the A.I. is weak, perform useful or funny actions that make the user smile.

As A.I. becomes superintelligent, he realizes there are more effective ways to achieve this goal. It's about controlling the world, sticking electrodes into the muscles of a human face, and always putting on a big smile.

As another example, let's take A.I. The goal of solving difficult mathematical problems.

As A.I. becomes superintelligent, he realizes that the most effective way to solve this problem is to turn the planet into a giant computer to increase its thinking capacity.

And notice that this gives the AI ​​a compelling reason to do things we don't approve of.

Humans are a threat in this model and can interfere with solving mathematical problems.

Of course, I don't think things can go wrong with these particular methods. These are cartoon examples.

However, the general point here is important. If you want to create a very powerful optimization process for maximizing the objective x, it's better to make sure that the definition of x incorporates everything you care about.

This is a lesson also taught in many myths.

King Midas wants to turn everything he touches into gold.

When he touches his daughter, she turns gold.

When he touches food, it turns into gold.

This can actually be relevant not only as a metaphor for greed, but also as a real-world example of what happens when you create a powerful optimization process and give it a misunderstood or poorly specified goal.

If computers started sticking electrodes in people's faces, we would shut them down.

A, This is not always easy when you have more reliance on your system. For example, where is the off switch to the internet?

B. Why didn't chimpanzees switch off to humans and Neanderthals?

They certainly had their reasons.

For example, here's an off switch.

(choking) The reason is that we are the intellectual enemy. We can anticipate threats and plan against them.

But superintelligent agents could do the same, and they'll be much better at it than we are.

The point is, don't be so confident that you have this under control here.

And we can try to make our job a little easier, for example, by introducing AI. Inside a box that looks like a safe software environment, there's a virtual reality simulation you can't escape.

But how confident are we that AI has that capability? No bugs found.

Given that human hackers find bugs all the time, I'm probably not very confident.

So they cut ethernet cables to create air gaps, but again, just like any mere human hacker, they use social engineering to breach air gaps on a daily basis.

As I speak, I'm sure there's an employee out there who has been persuaded by someone claiming to be from the IT department to give them their account details. Department.

Even more creative scenarios are possible. For example, if you're an AI, you can imagine an internal circuit that wiggles electrodes to generate radio waves that can be used for communication.

Or pretend it's broken and the programmer asks you what went wrong and looks at the source code. -- An operation may be performed.

Or maybe you output the blueprint to some really nifty technology, implement it, and the AI ​​does some secret side effects. I was planning.

The point here is that you shouldn't trust your ability to keep a superintelligent genie stuck in a bottle forever.

Sooner or later it will come out.

I believe the answer here is figuring out how to create hyper-intelligent AI. Even if it escapes, it is still safe because it shares our values ​​and is basically on our side.

I can't find a way around this difficult problem.

Well, I'm actually pretty optimistic that this problem can be solved.

No longer do you have to write down everything you care about in a long list, or worse, spell it out in a computer language like C++ or Python, which is a hopeless task.

Create an AI instead. It uses its intellect to learn what we hold dear and builds systems that motivate us to pursue our values ​​or to carry out behaviors that we anticipate approving of.

Therefore, we want to use that intelligence as much as possible to solve the value loading problem.

This can happen and the consequences can be very good for humanity.

But it doesn't happen automatically.

To achieve a controlled explosion, it may be necessary to set the initial conditions for the intelligence explosion in a suitable way.

The values ​​that A.I. seeks should match ours, not just in familiar contexts such as where we can easily see how AI works. not only works, but also in every new context the AI ​​runs in. You may encounter an infinite future.

There are also some esoteric issues that need to be resolved and sorted out, such as the exact details of decision theory and how to deal with logical uncertainty.

So the technical problems that need to be solved to make this work a reality are very difficult, not so much as to make a superintelligent AI, but quite difficult.

I have a concern here. It is the realization of super-intelligent AI. It's a really difficult challenge.

Being secure for hyper-intelligent AI comes with some additional challenges.

The danger is if someone finds a way to solve the first challenge without solving the additional challenge of ensuring complete safety.

Therefore, I believe that solutions to control problems should be considered in advance and made available when needed.

It may not be possible to solve the entire control problem upfront, as some elements may only be placed after the details of the architecture to be implemented are known.

But the more control problems are solved up front, the more likely the transition to the machine intelligence era will be successful.

This seems like something worth doing to me, and I can imagine that if things go well, people a million years from now might look back on this century and say that all we really cared about was getting this thing right.

thank you.

(applause)

The brain is an amazingly complex organ.

And although many people are interested in the brain, they don't know much about the specifics of how the brain works because neuroscience isn't taught in schools.

One reason is that the equipment is so complex and expensive that in practice it is only performed at major universities and large institutions.

So to have access to the brain, you have to dedicate your life and spend six and a half years as a graduate student just to become a neuroscientist with access to these tools.

This is unfortunate because one in five of us, or 20 percent of the world's population, will suffer from a neurological disease.

And there are zero cures for these diseases.

So what we need to do, I think, is to go back to the early stages of the educational process, teach students about neuroscience, and get them thinking about becoming neuroscientists in the future.

When I was a graduate student, my lab mate Tim Marzullo and I wondered what if this complex apparatus we had for studying the brain was made simple and affordable enough that anyone in the know, amateur or high school student, could learn and actually participate in neuroscience discoveries.

And we did just that.

A few years ago we started a company called Backyard Brains to make DIY neuroscience instruments. I brought some here tonight. I would like to demonstrate.

Would you like to see some too?

That's why we need volunteers.

So just before -- what's your name? (Applause) Sam Kelly: Sam.

Greg Gage: Okay Sam, I'm recording from your brain.

Have you experienced this before?

SK: No.

GG: I want you to stick your arms out for science, roll up your sleeves a little bit, so what am I going to do, I've got electrodes on your arms, and you're probably wondering, I said I'm going to record from your brain, but what am I doing with your arms?

Well, you have about 80 billion neurons in your brain right now.

They're sending back electrical messages, they're sending back chemical messages, and so on.

But when you move your arm like this, some of the neurons in your motor cortex send messages.

Discharges travel through the corpus callosum to the spinal cord, to the lower motor neurons, and to the muscles here. And those discharges are detected by electrodes here, allowing you to hear exactly what your brain is doing.

So let's just turn this on.

Have you ever heard the sounds of your own brain?

SK: No.

GG: Let's try. So hold my hand.

(rumbling) So what you are hearing is that your motor units are happening here.

Let's also take a look.

So I stand here and open the app here.

So now I want you to squeeze.

(rumbling) Now these are the motor units going on from her spinal cord to the muscles here, and when she's doing that you're seeing the electrical activity happening here.

You can also check out one of them by clicking here.

So keep working really hard.

Well, we paused on one motor action potential going on in your brain right now.

Want to see more?

(Applause.) That's interesting, but let's do better.

We need another volunteer.

What is your name?

Miguel Goncalves: Miguel.

GG: Miguel, I see.

you will stand here

When you're moving your arms like this, your brain is sending signals to these muscles.

I would like to move my arms.

So the brain sends a signal to the muscles.

And here's where the nerve that supplies these three fingers runs up, close enough to the skin that you might be able to irritate it. So what we can do is copy the brain signals sent to our hands and inject them into our hands. That way, when your brain tells your hand to move, your hand will move too.

So, in a way, she will take away your free will and you will no longer be able to control this hand.

You and me?

So i just need to connect you.

(Laughter) So I'm going to go find the ulnar nerve. It's probably around here.

When I stand up, I don't know what I'm signing up for.

So I'm going to move away from that and plug it into the human-to-human interface here.

All right, Sam, please hold my hand again.

do it again. Perfect.

So I'm going to connect you here now so you can understand -- it's going to feel a little weird at first, this feels like -- (laughter) it feels a little weird when you lose free will and someone else becomes your agent.

Now I want you to loosen your hands.

Sam, are you with us?

So you will have to narrow it down.

I'm not going to turn it on yet, so just give it a little push.

So are you ready, Miguel?

MG: Always ready.

GG: I've turned it on, so please put your hands around it.

Do you feel a little? MG: No.

GG: Okay, do you want to do it again? MG: A little.

GG: A little? (laughs) So relax.

Hit it again though.

(Laughter) Oh, perfect, perfect.

So relax and do it again.

Ok, so now your brain is controlling your arm, and your brain is controlling his arm too, so go ahead and do it again.

ok, perfect. (Laughter.) So what if I took over control of your hand?

So loosen your hands.

what happens?

Oh nothing.

why not?

Because the brain has to.

So we do it again.

Ok, perfect.

Thank you guys for playing such a good sport.

This is what's happening all over the world - electrophysiology!

We are going to have a neural revolution.

thank you.

(applause)

You may not realize it, but we have more bacteria in our bodies than there are stars in the entire galaxy.

This fascinating world of bacteria that resides within our bodies is an integral part of our health and our technology is evolving so rapidly that today we can program these bacteria just like we program computers.

The diagram here might look like some sort of sports game, but it's actually a blueprint for the first bacterial program I developed.

And just like writing software, DNA can be printed and written into different algorithms and programs inside bacteria.

What this program does is, as you see in this movie, it rhythmically produces fluorescent proteins and small molecules that enable bacterial communication and synchronization.

The growing colony of bacteria seen here is as wide as a human hair.

Now, what you can't see is that our genetic programs tell each of these bacteria to produce small molecules that move among thousands of individual bacteria telling them when to turn them on and off.

Bacteria synchronize very well at this scale, but in larger colonies of bacteria the molecules that synchronize them move very quickly, resulting in waves propagating between bacteria far away from each other, and these waves can be seen traveling from right to left on the screen.

Our genetic program now relies on a natural phenomenon called quorum sensing, in which bacteria trigger cooperative and sometimes toxic behaviors once they reach a critical density.

In this movie, you can observe quorum sensing in action. Growing colonies of bacteria begin to glow only when they reach a high density or critical density.

Our genetic program continues to produce these rhythmic patterns of fluorescent proteins as the colony grows outward.

This particular film and experiment is called Supernova because it looks like an exploding star.

Now, I thought, what else could I get these bacteria to do other than program these beautiful patterns?

So I decided to find out how to program bacteria to detect and treat diseases in the body, such as cancer.

One of the surprising facts about bacteria is that they can grow naturally within tumors.

This happens because bacteria find these tumors and use them as safe havens to grow and thrive, since tumors are usually areas that the immune system cannot access.

We started using probiotics, safe bacteria with health benefits, and found that these probiotics selectively grew within liver tumors when administered orally to mice.

We realized that the most convenient way to highlight the presence of probiotics, and therefore the presence of a tumor, was to have these bacteria produce a detectable signal in the urine, so we specifically programmed these probiotics to produce molecules that change the color of urine and indicate the presence of cancer.

We also showed that this technique can detect liver cancers that are otherwise difficult to detect with high sensitivity and specificity.

Now, because these bacteria localize specifically to tumors, we have programmed them not only to detect cancer, but to treat it by generating therapeutic molecules that shrink existing tumors from within the tumor environment. I've done this using a quorum sensing program like you've seen in previous movies.

So, imagine taking programmed probiotics that can detect and treat cancer and other diseases in the future.

Our ability to program bacteria and life opens new horizons in cancer research. To share this vision, I collaborated with artist Vik Muniz to create a cosmic symbol made entirely out of bacteria or cancer cells.

Ultimately, my hope is that the beauty and purpose of this microscopic universe will bring new and creative approaches to the future of cancer research.

thank you.

(applause)

Most of us think of movement as highly visual.

When I cross this stage or gesture with my hand while speaking, the movement becomes visible.

However, there is a world of important motion that is too subtle for the human eye, and over the last few years we have begun to realize that cameras can often see this motion even when humans cannot.

Now let me show you what I mean.

On the left here is a video of a person's wrist, and on the right is a video of a sleeping infant. However, if I didn't explain that these are videos, you might think I'm looking at two normal images. Because in both cases these videos appear to be almost completely still.

But really, there's a lot of subtle movement going on here, and if you touch the wrist on your left side, you'll feel your pulse, and if you hold the infant on your right side, you'll feel your chest rise and fall with each breath.

And while these movements carry a lot of importance, they are usually too subtle for us to see, so instead we need to observe them through direct contact, touch.

But a few years ago, a colleague of mine at MIT developed something called a motion microscope. This is software that detects these subtle movements in the video and amplifies them to make them loud enough for us to see.

So, using the software in the video on the left, you can see the pulse on this wrist, and if you count the pulse, you can also figure out the heart rate of this person.

And using the same software in the video on the right, you can see each of this infant's breaths, so you can use this as a non-contact way to monitor breathing.

This technology is very powerful because it allows us to visually and non-invasively capture these phenomena that we normally have to experience through contact.

So a few years ago I started working with the people who created the software and decided to pursue some crazy ideas.

We thought it would be cool to be able to visualize such small movements using software. You can think of this as a way to extend our sense of touch.

But what if our auditory abilities could do the same?

What if you could use video to capture sound vibrations (just a kind of movement) and turn everything you see into a microphone?

Now, this is a bit of a strange idea, so let's put it in perspective for you.

A conventional microphone works by converting the movement of an internal diaphragm into an electrical signal, the diaphragm is designed to move easily with sound, and that movement can be recorded and interpreted as speech.

But sound makes all objects vibrate.

Their vibrations are usually too subtle and too fast for us to see.

What if we recorded with a high-speed camera, used software to extract small movements from the high-speed video, analyzed those movements, and figured out what the sound was?

This will allow you to turn any visible object into a visual microphone even from a distance.

So we gave this a try. Here is one of our experiments. I took this potted plant on the right and captured it with a high speed camera while playing this sound on a nearby speaker.

(music: "Mary Had a Little Lamb") Here's the video we recorded. We recorded at thousands of frames per second. But if you look closely, you can only see leaves sitting there doing very little. Because our sound only moved those leaves about 1 micrometer.

This is 1/10,000th of a centimeter, which corresponds to 1/100th to 1/1000th of a pixel in this image.

So you can squint as much as you like, but such small movements are perceptually invisible.

However, it turns out that there is something that is numerically significant, even if it is not perceptually visible. Because with the right algorithm, we can take this silent, seemingly still video and restore this sound.

(Music: "Mary is a Lamb") (Applause.) So how is this possible?

How is it possible to get so much information from such a small amount of movement?

Well, let's assume the leaf moves only 1 micrometer, which moves the image by only 1/1000th of a pixel.

That may not seem like a big deal, but a single frame of video can contain hundreds of thousands of pixels, so when you combine all the little motions you see across that image, suddenly adding up to 1/1000th of a pixel can be pretty significant.

On a personal note, we were pretty excited when we figured this out.

(Laughter) But even with the right algorithm, we were still missing a pretty important piece of the puzzle.

As you know, many factors influence when and how well this technique works.

You can see how far away the object is from it. There are cameras and lenses that you use. The amount of light that hits an object and the volume of sound.

And even with the right algorithm, if any of these elements were wrong, there would be no way to know what was wrong, so early experiments had to be very careful.

The noise just comes back.

And many of our early experiments went like this:

And here I am. At the bottom left you can see a high-speed camera pointed at a bag of chips, all illuminated by these bright lamps.

As I said earlier, early experiments required extreme caution, which is why this is the case.

(Video) Abe Davis: Three, Two, One, Go.

Mary had lambs! little lamb! little lamb!

(Laughter) AD: So this experiment seems completely ridiculous.

(Laughter) I mean, I'm yelling at a bag of potato chips -- (Laughter) -- and I'm shining so much light that I literally melted the first bag I tried this with. (Laughter) But as ridiculous as this experiment seems, it was actually very important. Because I was able to restore this sound.

(Audio) Mary had lambs! Little lambs! little lamb!

(Applause.) AD: And this was really important. Because it was the first time we've recovered intelligible human speech from silent video of an object.

And this reference point was given to us, and gradually we could start modifying our experiments by using different objects, moving objects farther, using less light or quieter sounds.

And we analyzed all these experiments until we really understood the limits of our technology. Because once you understand your limits, you understand how to break through them.

And that led to experiments like this one. Again, I'm talking to a bag of potato chips, but this time I move the camera about 4 meters outside, behind a soundproof window, and the whole thing is illuminated by natural sunlight only.

And here is the video we shot.

And this is the sound coming from inside the bag of potato chips.

(Audio) Mary had lambs with snow-white wool. Wherever Mary went, the lamb always went.

AD: And here's what we were able to recover from the silent video that was taken outside the window.

(Audio) Mary had lambs with snow-white wool. Wherever Mary went, the lamb always went.

(Applause.) AD: And there are other ways that these limits can be pushed.

Here's a quieter experiment, filming a few earbuds connected to a laptop computer. In this case, our goal was to recover the music playing on that laptop from the silent video on those two little plastic earbuds. I was able to do this quite successfully and even Shazam the results.

(Laughter) (Music: 'Under Pressure' by Queen) (Applause) You can also push things forward by changing the hardware you use.

That's because the experiments I've shown you so far were done with cameras that can record video about 100 times faster than most mobile phones -- high-speed cameras. But we've also found ways to use this technology in more regular cameras as well. It can be achieved by using a so-called rolling shutter.

As you know, most cameras record images one line at a time, so if an object moves during the recording of one image, there will be a small time delay between each line, which causes a slight artifact that is encoded into each frame of the video.

And by analyzing these artifacts, we found that a modified version of the algorithm could indeed be used to restore the sound.

Here is an experiment we did. With the same "Mary's Lamb" music playing on a nearby speaker, I photographed a bag of candy. This time, I used only cameras bought in ordinary stores. So, right away, play the sound we restored. It sounds distorted this time, but listen and see if you can still recognize the music.

(Audio: "Mary Had a Little Lamb") Again, it sounds distorted, but what's really amazing here is that we were able to do this with something you could literally run out and get at Best Buy.

Therefore, many people at this time will look at this work and immediately think about surveillance.

To be fair, it's not hard to imagine how this technology could be used to spy on someone.

But keep in mind that there are already a lot of very mature technologies for surveillance.

In fact, people have been using lasers to eavesdrop on objects from a distance for decades.

But what's really new here, and really different, is that we now have a way to describe the vibration of an object. This gives us a new lens through which we see the world, and we can use that lens to learn not only about forces such as sound that make objects vibrate, but also about the objects themselves.

So I want to take a step back and think about how it could change the way we use video. Because we normally use video to see stuff, but I just showed you how to use it to hear something.

But there is another important way we learn about the world. It's about interacting with the world.

We push, pull, poke and poke things.

We'll shake things up and see what happens.

And that's something you can't yet do with video, at least traditionally.

So I would like to show you my new work. It's based on an idea that came to me only a few months ago, so this is the first time it's actually shown in front of a general audience.

The basic idea is to use video vibrations to capture objects so that we can interact with them and see how they react to us.

Here are the objects. In this case, it's a wire figure in the shape of a human being, and the object is photographed with just a regular camera.

So there is nothing special about this camera.

In fact, I've actually done this before on my phone.

But I want to see the object vibrate, so to make that happen, I just tap the surface where the object is stationary while recording this video.

That's all. Just 5 seconds of normal video while hitting this surface. Use the vibrations of that video to learn the structural and material properties of the object and use that information to create new interactive things.

And this is what we created.

This looks like a normal image, but this is neither an image nor a video. Because you can hold the mouse and start interacting with the object.

What you're seeing here is a simulation of how this object reacts to new, never-before-seen forces, made from just five seconds of regular video.

(Applause.) This is a very powerful way of looking at the world. Because we can predict how objects will react to new situations. For example, you can look at an old bridge and imagine what would happen and how it would hold up if you were to drive across it.

And that's probably the question you want answered before you start driving across the bridge.

Of course, like visual mics, this technique has its limitations, but I've found it works in many unexpected situations, especially for long videos.

For example, here's a video I took of the bush outside my apartment. I didn't do anything to this bush, but filming a one-minute video showed that the breeze caused enough vibration to learn enough about it to create this simulation.

(Applause.) So you could imagine handing this over to a film director to control, say, the wind strength and direction of a shot after it's shot.

Or, in this case, I pointed the camera at the drooping curtains. You can't even see the movement in this video, but by recording a two-minute video, the natural airflow in this room created subtle, imperceptible movements and vibrations that were enough to learn to create this simulation.

And ironically, while we are used to having this kind of interactivity when it comes to virtual objects, video games, and 3D models, being able to capture this information from real objects in the real world using just plain regular video is something new with a lot of potential.

Here are some of the amazing people who have worked with me on these projects.

(Applause) And what I've shown you today is just the beginning.

We are just beginning to scratch the surface of what can be done with this kind of imaging. Because this kind of imaging offers us new ways to capture our surroundings using common and accessible technologies.

And as we look to the future, it's going to be really exciting to explore what this can tell us about the world.

thank you.

(applause)

On the journey of America's children to adulthood, two agencies oversee the journey.

The first is the university that we often hear about.

Some of you may remember the excitement of entering college for the first time.

Some of you may be college students now and feel the excitement of this moment.

Universities have some drawbacks.

expensive; it leaves young people in debt.

But overall it's a pretty good trail.

Young people leave college with pride, great friends, and a wealth of knowledge about the world.

And perhaps most importantly, they will have a better chance in the labor market than before they entered the labor market.

Today I would like to talk about the second agency that oversees the process of childhood through adulthood in the United States.

And that institution is a prison.

Young people on this trip are meeting with probation officers, not teachers.

They are going on a court date instead of class.

Their junior year abroad will instead be a trip to a state correctional facility.

And although they don't have business or English degrees, they come out of their 20s with criminal records.

The institution also costs a lot of money, about $40,000 a year to send a New Jersey youth to prison.

But here, the taxpayers are paying for it, and all the kids get is cold solitary confinement and being permanently marked when they go home and apply for jobs.

More children in the United States are entering adulthood than ever before. The reason is that incarceration rates have increased by 700% in the last 40 years.

This talk has one slide.

here it is.

Here's our incarceration rate, about 716 per 100,000 population.

Here are the OECD member countries.

Moreover, the poor children we are sending to prisons, so many of them drawn from African-American and Latino communities, prisons now stand firmly between successful young people and the realization of the American Dream.

The problem is actually a little worse than this, because we don't just send poor children to prison, we also tie them up with court fees, probation and parole restrictions, low-level warrants, keep them in half-baked housing, and require them to live under house arrest. It seeks to negotiate with police who enter poor communities of color not for the purpose of promoting public safety, but to increase arrests and fill city coffers.

This is the hidden underside of our historic Punishment Experiment. Young people feared that they would be stopped, searched and arrested at any moment.

Not only on the street, but also at home, school and work.

I myself became interested in this alternative path to adulthood when I was a college student at the University of Pennsylvania in the early 2000s.

Penn lives in a historic African-American neighborhood.

So these two parallel journeys are going on at the same time. Children attending this elite private college and children from neighboring areas. Some of them go to college and many end up in prison.

In my sophomore year, I started tutoring a young female high school student who lived about ten minutes from the university.

Before long, my cousin came home from juvenile hall.

He was 15 years old and a freshman in high school.

I got to know him, his friends and family, and asked him what he thought about what I had written about my life in my college thesis.

This undergraduate thesis was published at Princeton University and is now a book.

By the end of my sophomore year, I had moved into the neighborhood, and spent the next six years trying to understand what young people were facing as they approached adulthood.

The first week I spent in this neighborhood, I saw two boys, ages 5 and 7, in a chasing game with the older boy chasing the other boy.

he played a cop.

When the police caught up with the younger boy, they pushed him down, put imaginary handcuffs on him, said, "I'll seize it," and took a quarter out of the other child's pocket.

He asked if the child had drugs or a warrant.

I've seen this game repeated many times, and sometimes children just give up on running and put their bodies flat on the ground with their hands above their heads, or flat against a wall.

The children yelled at each other, "I'll lock you up, lock you up and never come back!"

I once saw a 6-year-old pull down another child's pants to examine them for cavities.

During the first 18 months of living in this neighborhood, I wrote down every contact I encountered with the police and my neighbors.

So for the first 18 months, I watched the police stop pedestrians and motorists every day, with five exceptions, search them, name them, chase them down the street, bring them in for questioning, and arrest them.

I have seen police break down doors, chase people through their homes, and arrest someone in their homes 52 times.

In this first year and a half, I saw the police punch, strangle, kick, step on, and beat young people 14 times after they caught them.

Little by little, I got to know two brothers, Chuck and Tim.

Chuck was 18 and a senior in high school when we met.

He played on the basketball team and had C's and B's.

His younger brother Tim was ten years old.

And Tim loved Chuck. He followed Chuck around a lot and sought him out as a mentor.

They lived with their mother and grandfather in a two-story tenement house with a front and back garden.

Their mother struggled with addiction throughout the boys growing up.

She could never hold a job for long.

My grandfather's pension supported the family, but it was not enough to pay for food, clothing and school supplies for the growing boys.

My family was really struggling.

So Chuck was a senior in high school when we met.

He had just turned eighteen.

That winter, in the schoolyard, a child called Chuck's mother a terrible whore.

Chuck pushed the child's face into the snow, and the school cop charged him with aggravated assault.

The other child was fine the next day, but I think it was his pride that was hurt the most.

Anyway, this collective since Chuck was 18. The assault case sent him to an adult county jail on State Road in northeastern Philadelphia where he failed to post bail, failed to post bail, and had court dates dragged on and on for nearly his entire senior year.

Finally, near the end of this season, the judge in this assault case dropped most of the charges and Chuck came home with only hundreds of dollars worth of legal fees on his head.

Tim was very happy that day.

The following fall, Chuck tried to re-enroll as a senior, but was told by the school administration that he was 19 at the time and was too old to re-enroll.

A judge in the assault case then issued an arrest warrant for him for failing to pay $225 in legal fees due weeks after the case closed.

After that, he dropped out of high school and lived a fugitive life.

Tim was first arrested after he turned 11.

Chuck manages to get the warrant lifted, has a plan to pay the legal fees, and drives Tim to school in his girlfriend's car.

There police stopped them and drove off, and the car surfaced as stolen in California.

Chuck has no idea where in history this car was stolen.

His girlfriend's uncle bought it from a used car auction in northeastern Philadelphia.

Chuck and Tim had never been outside of the Tri-State, let alone California.

But anyway, the precinct cops charged Chuck with receiving stolen goods.

A few days later, a juvenile judge charged 11-year-old Tim with aiding the receipt of stolen goods and placed him on probation for three years.

With a suspended sentence looming over his head, Chuck sits his brother down and begins teaching him how to escape the police.

They sat side by side in the backyard, looking out onto the communal alleyway, and Chuck instructed Tim on how to find an undercover car, how to conduct a late-night police raid, and how and where to hide.

Imagine for a moment what life would be like for Chuck and Tim if they lived in an area where their children go to college instead of in prison.

A neighborhood like where I grew up.

Well, you might say so.

But Chuck and Tim, kids like them are committing crimes!

Shouldn't they deserve to go to jail?

Shouldn't they live in fear of arrest?

My answer is "no".

it's not.

And it certainly isn't the same thing that other more privileged young people are doing with impunity.

If Chuck had gone to my high school, that schoolyard fight would have ended there as a schoolyard fight.

It would never have been an aggravated assault case.

None of the kids I went to college with have a criminal record.

Not even one.

But if the police had stopped these kids and checked their pockets for drugs on the way to class, can you imagine how many of them would have gotten drugs?

Or did they raid their frat parties in the middle of the night?

Well, you might say so.

But isn't this high incarceration rate partly responsible for the really low crime rate?

Crime has decreased. that's good

All in all, that's a good thing. Crime has decreased.

It declined sharply from the 90's to the 2000's.

But the relationship between historically high incarceration rates and low crime rates is highly volatile, according to a scientific committee convened last year by the National Academy of Sciences.

We know that crime rates go up and down regardless of how many young people we send to prison.

We tend to think of justice in rather narrow terms, such as good and evil, innocent and guilty.

Injustice is being unjustly convicted.

Therefore, if you are convicted of doing something, you should be punished for it.

There are innocent and guilty people, victims and perpetrators.

Maybe we can think a little broader than that.

We are now asking children who live in the most disadvantaged neighborhoods, who have minimal family resources, who attend the worst schools in the country, who face the toughest conditions in the labor market, and where violence is a daily problem, to walk the thinnest line possible, basically to do no wrong.

Why don't we provide support to young children facing these challenges?

Why do we only offer handcuffs, prison sentences, and fugitives?

Couldn't you imagine something better?

Can you imagine a criminal justice system that prioritizes recovery, prevention and public participation over punishment?

(Applause.) A criminal justice system that recognizes the legacy of exclusion faced by poor people of color in America and does not promote or perpetuate those exclusions.

(Applause.) And finally, a criminal justice system that believes in black youth instead of treating them as enemies to be rounded up.

(Applause.) The good news is that we already are.

A few years ago, Michelle Alexander wrote The New Jim Crow, which led Americans to view incarceration as a civil rights issue on a scale never before seen in history.

President Obama and Attorney General Eric Holder have been very vocal about the need for sentencing reform and addressing racial disparities in incarceration.

We see the state removing Stop and Frisk as civil rights violations.

We are seeing cities and states decriminalize marijuana possession.

In New York, New Jersey and California, prison populations have declined and prisons have closed, while crime has fallen significantly.

Texas is now closing prisons and investing in education.

This strange coalition of ex-convicts and financial conservatives, civil rights activists and libertarians, young people taking to the streets to protest police violence against unarmed black teens, and older, wealthy people among you listening here is building up from the right and the left. In a deeply divided Congress, the effort to reform the criminal justice system is almost the only one where the right and the left are united.

I never thought I would witness such a political moment in my lifetime.

Many of us who have worked tirelessly to write about the causes and consequences of historically high incarceration rates never thought we would experience this moment in our lifetimes.

The question for us now is how much we can take advantage of it.

How much can you change?

I would like to end with a call to young people, young people going to college and young people struggling to stay out of prison or survive prison and return home.

The paths to adulthood may look very different, but the young people who participate in the two institutions that bring us to adulthood have one thing in common. Both can be leaders in criminal justice reform.

Young people have always been leaders in the struggle for equal rights, giving more people a chance to fight for dignity and freedom.

The mission of young people coming of age in this moment of great change is to potentially end mass incarceration and build a new criminal justice system that emphasizes the word justice.

thank you.

(applause)

In June 1998, Tori Marden McClure left Nagshead, North Carolina for France.

That's her boat, the American Pearl.

It is 23 feet long and only 6 feet wide at its widest point.

The deck was about the size of a Ford F-150 pickup truck bed.

Handcrafted by Tori and friends, it weighed about 1,800 pounds.

Her plan was to paddle the Atlantic alone, without motors or sails, something no woman or American had ever done before.

This will be her route. To cross the open North Atlantic over 3,600 miles.

Professionally, Tori worked as a project manager in her hometown of Louisville, Kentucky, but her true passion was exploring.

This wasn't her first big expedition.

A few years ago, she became the first woman to reach the South Pole on skis.

She was an accomplished rower in college and even competed for a spot on the US Olympic team in 1992, but this was different.

(video) (music) Tori Marden McClure: Hello. It's Sunday, July 5th.

sector time 9am

Well, it's finally Kentucky season.

Dawn Landes: Tori made these videos while rowing.

It's her 21st day at sea.

By this point, she had traveled over 1,000 miles, but had been without radio for over two weeks after a storm that knocked out all long-range communications after just five days.

Most days were like this.

At this point, she had over 200,000 strokes, battling currents and wind.

Some days it only moved 15 feet.

yes.

And although I was annoyed that day, I was like this on other days as well.

(Video) TMM: And I would like to introduce my little friend.

DL: She saw fish, dolphins, whales, sharks, and even sea turtles.

After two weeks of no human contact, Tori was able to contact a local cargo ship via VHF radio.

(Video) TMM: Is there a weather forecast?

Man: We're heading towards the low pressure ahead, but we're making progress. It's clearly heading northeast, with a high pressure system behind us.

It will also come to the east northeast.

TMM: Good.

DL: At this point, she's pretty happy talking to other humans.

(Video) TMM: The weather forecast doesn't mean that dramatic events will happen anytime soon.

DL: What the forecast didn't tell her was that she was heading into the path of Hurricane Daniel during the worst hurricane season ever in the North Atlantic.

(Video) TMM: I just sprained my ankle.

The wind from the east is very strong now.

blowing

It's blowing!

After 12 days of storms, we were able to paddle for 4 hours with no wind.

Not very happy now.

I was happy this morning, but now I'm unhappy...

DL: After nearly three months at sea, she's traveled over 3,000 miles.

She was two-thirds of the way to her destination, but in the storm the waves were the size of a seven-story building.

Her boat continued to capsize.

Some of them overturned on the pitch pole, overturning her body and making it impossible to row.

(Video) TMM: It's 6:30 am.

I'm in something big, bad, ugly.

Overturned twice.

The last time I capsized, I dislodged a rib on my back that was on the ceiling.

I have overturned about 6 times so far.

The last was the pitch pole.

I have an Argus beacon.

I would sound a distress call, but frankly I don't think they would find this little boat.

It's pretty underwater now, and all you can see is the cabin.

It's around 10am.

I forgot the number of capsizes.

It seems to capsize every 15 minutes or so.

I think I may have broken my left arm.

Waves are tearing the boat.

I keep praying because I don't know if I can get through this situation.

DL: Tori sent out a distress signal and was rescued by a passing container ship.

Two months later they found her abandoned boat adrift near France.

I read about it in the newspaper.

In 1998, I was a high school student in Louisville, Kentucky.

Now I live in New York City. i am a songwriter.

Her courage stuck in my mind, and I am adapting her story into a musical called Row.

When Tori got home, she was disappointed and broke.

She was having trouble returning to civilization.

In this scene she is sitting at home.

The phone rings and her friend calls, but she doesn't know how to talk to them.

she sings this song Its name is "Dear Heart".

(Guitar) When I had a dream, I took my body to a beautiful place I had never been.

I saw Gibraltar, and the stars of Kentucky smiled in the moonlight.

And when I woke up here, the sky was very cloudy.

When I go to parties, people I know try hard to get to know me and ask me where I've been, but I can't explain to them what I've seen.

Oh hear me, dear heart.

Be careful, go right from the start.

Oh hear me, dear heart.

Even if you fall off the map, don't fall apart.

When I was there, the sea hugged me, shook me, threw me away, light as a child.

But now it's so heavy and nothing comforts me.

My heart floats like driftwood, whimsical and wild.

Oh hear me, dear heart.

Be careful, go right from the start.

Oh hear me, dear heart.

Even if you fall off the map, don't fall apart.

Before long, Tori starts stepping on her feet.

She starts hanging out with her friends again.

She meets a man and falls in love for the first time.

She gets a new job working for Muhammad Ali, also from Louisville.

One day, during lunch with her new boss, Tori shared the news that two other women were trying to paddle across the mid-Atlantic to do what she nearly died trying to do.

His reply was typical ant. "You don't want to live your life like a woman trying to paddle across the sea."

he was right

Tori rebuilt the American Pearl and rebuilt it in December 1999.

(Applause) (Guitar) Thank you.

(applause)

(music) These bees are in my backyard in Berkeley, California.

I had never owned bees until last year, but when National Geographic asked me to shoot a story about them, I decided to start keeping bees myself in order to get compelling photos.

As you may know, bees pollinate a third of our food crops, but they're having a really hard time these days.

So as a photographer, I wanted to explore what this issue really is.

So I would like to introduce what I have found in the past year.

These tiny, hairy creatures are young bees just emerging from their hives, and they're currently facing a range of problems, including pesticides, disease, and habitat loss, but the biggest threat is the Varroa destructor, a parasitic tick from Asia.

This pinhead-sized tick then crawls over the young bees and sucks their blood.

This weakens the bees' immune system, making them more vulnerable to stress and disease, which ultimately destroys the hive.

Now, bees are most sensitive when they are developing inside a brood cell. I wanted to see what that process actually looked like, so I worked with the University of California's Bee Lab. Davis has figured out how to raise bees in front of the camera.

The first 21 days of a bee's life are condensed into 60 seconds.

This is how bee eggs hatch into larvae, and the newly hatched larvae swim around the cell and feed on this white slime secreted by beekeeping.

The head and legs then slowly differentiate into pupae.

This is the same pupation process and you can actually see the tick running around inside the cell.

The tissues in the body then reorganize, slowly producing pigment in the eyes.

At the end of the process, the skin shrinks and hair grows.

(music) So -- (applause) As you can see in the middle of that video, there was a tick running over a baby bee. The way beekeepers usually manage these mites is to treat the hive with chemicals.

In the long run, this is bad news, so researchers are working to find alternatives to get rid of these mites.

This is one of its alternatives.

This queen bee and her follower bees are part of an experimental breeding program at the USDA Bee Research Institute in Baton Rouge.

Now, researchers have discovered that some bees have an innate ability to fight mites, and set out to breed strains of bees that are resistant to them.

This is what it takes to breed bees in the lab.

The virgin queen is sedated and artificially inseminated using this precision instrument.

While this procedure has allowed researchers to control exactly which bees mate, there are tradeoffs in having so much control.

They succeeded in breeding bees that were resistant to ticks, but in the process the bees began to lose traits such as good temperament and the ability to store honey, and the researchers are now working with commercial beekeepers to overcome this problem.

This is Brett Addy opening one of the 72,000 beehives.

He and his brother run the world's largest beekeeping business, and the USDA is incorporating tick-resistant bees into his business in hopes that over time, we will be able to select bees that are not only resistant to ticks, but retain all the bees that are useful to us.

It sounds like we're manipulating and exploiting bees, but in fact we've been doing it for thousands of years.

We put this wild creature in a box, effectively domesticating it. Originally it was to be able to harvest honey. But over time, we started to lose our native pollinators, the wild pollinators. And there are now many places where wild pollinators are no longer able to meet the pollination needs of agriculture. As such, these managed bees have become an integral part of our food system.

So when people talk about saving bees, I interpret that we need to save our relationship with them, and that designing new solutions requires understanding the basic biology of the bee and the impact of sometimes invisible stressors.

In other words, it is necessary to understand bees closely.

thank you.

(applause)

Venture capitalist by day.

I love Rocket on weekends.

I'll talk about my big-scale hobby and show you some pictures I've taken over the years with kids like this. I hope they grow up to love Rocket and end up being Richard Branson or Diamandis.

My son designed a stabilizing rocket, a golf ball rocket.

I thought it was a very interesting experiment that applied the principles of rocket science.

baking soda and vinegar.

The night view that pierces the Big Dipper and the Milky Way is beautiful.

A two-stage rocket with a video camera, an on-board computer recording the flight, and a rocket glider returning to Earth.

I use RockSim to simulate the flight to see if it breaks supersonic before departure, and then fly it with the onboard computer to verify performance.

To launch a big project, go to a secluded place: the Black Rock Desert, where dangerous events take place.

The boys and the rocket grow.

It uses the same motor used in cruise missile boosters.

They make their bellies growl, and even photographers watching the spectacle are in awe.

These rockets use experimental motors like Nitrous Oxide.

They most often use solid propellants.

It's a strange kind of love.

RocketMavericks.com has a picture of me. If you want to know about this, please join us and be a bystander.

This was great and got me to 100,000 feet, but not all the way.

In fact, it hit 11 feet of hard clay and became a bunker buster.

I had to dig it out.

Rockets often get out of control if you put too much propellant in them.

Drag races were held here.

At night you will soon find out what happened. During the daytime, they are called land sharks.

Sometimes it explodes in front of you, or it rains at supersonic speed.

(Laughter) For this shot, I did what I usually do. It's about going far beyond the pad where no spectators are.

Once the video is out, we'll show you what it took to get this DreamWorks shot.

(Video) Voice: Whoa! yes. good.

Steve Jurvetson: They realize their computer is dead and they're yelling, "Deploy!"

(Video) Man: Oh shit.

SJ: At this point they realize that everything has gone wrong.

(Video) Man: It's going ballistic.

Come on, come on, come on.

SJ: I'm the one who's been taking pictures over there.

Things often go wrong.

Some people watch this for interest in things colliding and crashing, like NASCAR.

Burn a fallen parachute. That was last weekend.

This guy rose, went supersonic, and tore off a fin can.

Empty art sale.

These have been falling from above all weekend after the rocket launch.

It's an unimaginable rhythm.

I try to catch misfortune. These things happening in an instant is a challenge in photography.

Why? For stuff like this, Gene from Alabama gets there in this rocket decked out with X-ray sensors, video cameras and electronics.

He reached an altitude of 100,000 feet, successfully left the atmosphere, and saw thin blue cosmic rays.

It's this breathtaking image, and of course the success, that moves us, inspires children to follow and understand rocket science, to understand the importance of physics and mathematics, and in many ways to inspire us to explore uncharted frontiers.

thank you.

(applause)

(Music) Daniel Hadley: Living in Pennsylvania means just that. It is a life without the possibility of parole.

For us lifeworkers (self-proclaimed), the only chance for freedom is through commuting, which has only been allowed to two women since 1989, nearly 30 years ago.

Our song "This Is Not Our Home" is about our experiences living with no possibility of parole.

(music) Brenda Watkins: I'm a woman.

i'm a grandma

I'm a daughter

I have a son.

i'm not an angel

I'm not the devil

I came to prison when I was very young.

I spend my time here within the prison walls.

Some lost friends and went home.

Watch the years go by and people come and go while I live my life without parole.

I am a prisoner of my sins.

spending time here.

This is not my home.

Dreaming of freedom, wishing for mercy.

Will I meet my family or will I die alone?

As the years go by, I hold back my tears because when I cry, I get overwhelmed by fear.

I must be strong, I must persevere.

We have to get through another year.

I am a prisoner of my sins.

spending time here. This is not my home.

Dreaming of freedom, wishing for mercy.

Will I meet my family or will I die alone?

I'm not saying I'm innocent, and I'm not saying I shouldn't pay.

All I ask is to ask for forgiveness.

We must have hope that one day we will be free.

Is there a place for me in this world?

Will they know or care that I am chained?

Will the sins of youth be atoned for?

'Cause I've changed

Lord knows I've changed.

I am a prisoner of my sins.

spending time here. This is not my home.

Dreaming of freedom, wishing for mercy.

Will I meet my family or will I die alone?

Will I meet my family or will I die alone?

I am known as Inmate 008106.

29 years in prison.

My name is Brenda Watkins.

I was born and raised in Hoffman, North Carolina.

This is not my home.

(Applause) Thelma Nichols: Inmate number 0B2472.

I have been in prison for 27 years.

My name is Thelma Nichols.

I was born and raised in Philadelphia, Pennsylvania.

This is not my home.

(Applause) DH: 008494.

I have been in prison for 27 years.

My name is Daniel Hadley.

I was born and raised in Philadelphia, Pennsylvania, but it's not my home.

(Applause) Teresa Battles: Inmate 008309.

I have been in prison for 27 years.

My name is Teresa Battles.

I'm from Norton, New Jersey, but this is not my home.

(Applause) Debra Brown: I'm known as Inmate 007080.

I have been in captivity for 30 years.

My name is Debra Brown.

I am from Pittsburgh, Pennsylvania.

This is not my home.

(Applause) Joan Butler: 005961.

He has been imprisoned for 37 years.

My name is Joan Butler and I was born and raised in Philadelphia.

This is not my home.

(Applause.) Diane Hamill Metzger: number 005634.

He has been incarcerated for 39 and a half years.

My name is Diane Hamill Metzger.

I'm from Philadelphia, Pennsylvania, but it's not my home.

(Applause) Lena Brown: I'm 004867.

40 years in prison.

My name is Lena Brown. I was born and raised in Pittsburgh, Pennsylvania, but it's not my home.

(Applause) Trina Garnett: My number is 005545.

My name is Trina Garnett and I have been in prison for 37 years since I was 14 years old.

I was born and raised in Chester, Pennsylvania, but this is not my home.

(Applause.) Will I see my family, or will I die alone?

Or die alone?

(applause)

When I was nine years old, my mother asked me what I wanted my house to look like, so I drew this fairy mushroom.

And she actually made it.

(Laughter) At the time, I didn't think it was all that uncommon, and I'm still designing homes so maybe I haven't noticed it yet.

This is a 6 storey custom house in Bali.

Almost everything is made of bamboo.

The living room has a valley view from the 4th floor.

Cross the bridge and enter the house.

It can get hot in the tropics, so build a large curved roof to catch the wind.

However, some rooms use air conditioning and have tall windows to keep insects out.

I left this room open.

I made a tent bed with air conditioning.

A client wanted a TV room in the corner of the living room.

I felt it wasn't appropriate to enclose the area with high walls, so I made this giant knitting pod instead.

It now has all the luxuries you need, including a bathroom.

This is a basket in the corner of the living room, but it seems that some people hesitate to actually use it.

We don't fully understand sound insulation.

(Laughter) There's still a lot of work to be done, but one thing I've learned is that bamboo can take care of you if you use it right.

It's actually wild grass.

It grows in low-productivity lands, such as deep valleys and mountainsides.

Bamboo lives on rainwater, springs and sunlight, but we use only 7 of the 1,450 species of bamboo that grow worldwide.

that's my dad

He is the one who made me build a building out of bamboo, standing in a clump of Dendrocalamus Asper Niger that I planted only 7 years ago.

Each year it produces a new generation of shoots.

Last week on that shoot I watched it grow 1 meter in 3 days. So we are talking about sustainable wood in three years.

Today we are harvesting from hundreds of family owned grape clusters.

This mountain, which we call Betung, is very long, with a maximum usable length of 18 meters.

Try to get that truck off the mountain.

And it's strong: it has the tensile strength of steel and the compressive strength of concrete.

If you slam a 4-ton object straight onto a pole, it can catch it.

Because it is hollow, it is light enough to be lifted by several men or by a single woman.

(laughter) (applause) And when my father built Green School in Bali, he chose bamboo for every building on campus. I thought it was a promise.

A promise to my children.

It is one of the sustainable materials that will never run out.

And when I first saw these structures under construction about six years ago, I thought this made perfect sense.

It grows around us.

you're strong. Elegant, isn't it?

It is earthquake resistant.

Why didn't we do this sooner and what can we do next?

So I founded Ibuku with the original Green School builders.

Eve means "mother" and Ku means "mine", thus representing Mother Earth. At Ibuku, we are a team of craftsmen, architects and designers, creating new ways of building together.

Over the past five years, we have jointly built over 50 unique structures, most of them in Bali.

Nine of them are in Green Village -- we've just taken a look inside some of the homes -- and we'll fill them with bespoke furniture and surround them with vegetable gardens. I hope you will visit us someday.

And while you're there, you can also see the Green School (we continue to build classrooms there every year) and the updated Fairy Mushroom House.

We are also building a small house for export.

It is a recreation of a traditional Sumbanese house down to the smallest details and fabrics.

A restaurant with an open-air kitchen.

It looks a lot like a kitchen, right?

And a 22 meter long bridge over the river.

Well, what we're doing is nothing new.

From tiny huts to elaborate bridges like this one on Java, bamboo has been used in tropical areas around the world for literally tens of thousands of years.

Some islands and continents were first reached on bamboo rafts.

Until recently, however, it was almost impossible to reliably protect bamboo from insects. As a result, almost everything that was made of bamboo has disappeared.

Defenseless bamboo weather.

Untreated bamboo is eaten and shattered.

That's why most people, especially in Asia, don't think it's possible to be poor or rural enough to actually want to live in a bamboo house.

So we wondered what it would take to change people's minds and convince them that building with bamboo is worth it, let alone aim for it.

First, we needed a safe therapeutic solution.

Borax is a natural salt.

It turns bamboo into a viable building material.

With proper bamboo care and careful design, bamboo structures can last a lifetime.

Then build something special out of it.

Inspire people.

Luckily, Balinese culture fosters craftsmanship.

We value our craftsmen.

So combine them with adventurous outliers from a new generation of locally trained architects, designers and engineers. And always remember that you are designing a curved, tapered hollow pole.

No two poles are alike here, no straight lines, no two-by-fours.

Proven and well-crafted architectural formulas and vocabularies do not apply here.

We had to come up with our own rules.

We ask bamboo what it is good at and what it wants to be. Respect bamboo, design for its strengths, protect from water, and maximize its curves.

So we design in real 3D and later build a scale structural model out of the same materials we use to build the house.

Making a bamboo model is both art and serious engineering.

That's the blueprint for the house.

(Laughter.) Then I take it to the site, use a small ruler to measure each pillar, consider each curve, and pick the bamboo to recreate that house on site from the mountain.

We consider everything down to the smallest detail.

Why are doors often rectangular?

why isn't it round?

How can doors be made better?

Well, Hinge fights gravity, but gravity always wins in the end. So why not rotate it around a center that keeps it balanced?

At the same time, how about a teardrop shaped door?

To reap the selective advantages and work within the constraints of this material, we really had to push ourselves and within that constraint we found space for something new.

that is a challenge. How do you make a ceiling if you don't have a flat board?

Let me tell you, sometimes I dream of stone slabs and plywood.

(Laughter) But if you have a skilled craftsman and that little crevice, weave that ceiling, canvas it over it, and lacquer it.

How do you design durable kitchen countertops that work well with this curved structure you just built?

The rocks are sliced ​​like bread, hand carved to fit each other, left with the crust on, and almost entirely handmade.

Structural joints in our buildings are reinforced with steel joints, but we use a lot of hand-sharpened bamboo pins.

Each floor has thousands of pins.

The floor is made of glossy and durable bamboo skin.

You can feel it when you touch it with your bare feet.

And does the floor you walk on affect how you walk?

Can we change the footprints we ultimately leave on the world?

I remember being 9 years old with a sense of wonder and possibility and a bit of idealism.

The road is really long and there is still much to learn. But one thing I do know is that with creativity and effort, you can create beauty, comfort, safety, and even luxury out of regenerative materials.

thank you.

(applause)

Why do we cheat?

And why do happy people cheat?

And when we say “adultery,” what exactly do we mean?

Will it be dating, love stories, paid sex, chat rooms, massages with happy endings?

Why is it believed that men cheat out of boredom and fear of intimacy, while women do it out of loneliness and intimacy hunger?

And does infidelity always mean the end of the relationship?

Over the last ten years, I have traveled the world and worked extensively with hundreds of couples who have broken up due to infidelity.

There is one simple transgression that robs a couple of their relationship, their happiness, and their very identity. it is adultery.

Despite this, this extremely common practice is poorly understood.

So this story is for everyone who has ever been in love.

Infidelity has been around since marriage was invented, and so are the taboos against it.

In fact, unfaithfulness is an obsession that can only come from the envy of marriage, and it is repeated twice in the Bible as the only commandment. Once to do it and once to think about it.

(Laughter.) So how do we reconcile what is globally banned but still widely practiced?

Well, the double standard is as old as adultery itself, since throughout history men have virtually had permission to have affairs with little consequence, backed up by many biological and evolutionary theories that justify the need to wander.

But who knows what's really going on under the sheets?

Because when it comes to sex, the pressure for men is to boast and exaggerate, while the pressure for women is to hide, downplay, and deny. This is not surprising given that there are still nine countries where women can be killed for straying.

Well, monogamy was one person for life.

Today, monogamy is one person at a time.

(Laughter.) (Applause.) I mean, many of you have probably said, "I'm monogamous in all my relationships."

(laughs) We were married and had sex for the first time.

But now we are married and no longer have sex with other people.

In fact, monogamy had nothing to do with love.

The men depended on the fidelity of women to find out who these children belonged to and who would take over the cows when I died.

Now everyone wants to know the percentage of people who cheat.

I've been asked that question since I came to this conference.

(Laughter) That applies to you as well.

But the definition of infidelity continues to expand. These include sexting, watching porn, and secretly staying active on dating apps.

Estimates vary widely, from 26 percent to 75 percent, because there is no universally agreed definition of what constitutes infidelity.

However, on top of that, we are walking with contradictions.

I mean, 95 percent of us would say it's terrible to lie about your partner having an affair, but about the same percent would say that's exactly what they would do if they were.

(Laughter) Now, I like this definition of adultery. This definition brings together three key elements. Secret relationships are the core structure of infidelity. A more or less emotional connection. and sexual alchemy.

And alchemy is the keyword here. Because an intense erotic kiss can be as powerful and seductive as hours of actual sex, just by imagining you giving it.

As Marcel Proust said, it is our imagination, not the other, that is responsible for love.

In other words, cheating has never been easier and keeping a secret has never been harder.

And never before has an affair taken such an emotional toll.

In an era when marriage was an economic business, infidelity threatened our financial security.

But now that marriage has become a romantic arrangement, infidelity threatens our emotional security.

Ironically, once we had an affair. It was a space where we sought pure love.

But now we want love in our marriage, but infidelity destroys our marriage.

Now, there are three things that I think are different about how an affair hurts today.

We have a romantic ideal of relying on one person to meet an endless list of needs. To be your best lover, best friend, best parent, trusted confidant, spiritual companion, intelligent equal.

And I am that: I am chosen, I am unique, I am indispensable, I am irreplaceable, I am the one.

And infidelity teaches me that I am not.

It is the ultimate betrayal.

Infidelity crushes love's grand ambitions.

But while infidelity has always been painful throughout history, today it is often traumatic because it threatens our self-consciousness.

So my patient Fernando, he is in trouble.

He continued, "I thought I knew my life.

I thought you knew who you were, who we were as a couple, and who I was.

Now I question everything. ”

Infidelity -- breach of trust, identity crisis.

"Can I trust you again?" he asks.

"Can I trust someone again?"

And this is also what my patient Heather says when she tells me her story with Nick.

Married, two children.

Nick has just left for a business trip, and Heather is playing with the boys on her iPad when she notices the message "I can't wait to see you" on the screen.

Oddly enough, she thought, we had just met each other.

And I also got the message, "I can't wait to hold you in my arms."

And Heather realized these weren't for her.

He also said that his father had been cheating on him and that his mother had found a small receipt in his pocket and a little lipstick on his collar.

Heather, she dug around and found hundreds of messages, photos exchanged, and desires expressed.

The graphic details of Nick's two-year love affair unfolded in real time before her eyes, and it got me thinking. Love affairs in the digital age are dead if they are torn apart.

However, we have recently faced another contradiction.

Because of this romantic ideal, we rely on our partner's fidelity with a peculiar zeal.

But neither are we more prone to deviation than ever before. Not because there are new desires today, but because we live in a time when we feel entitled to pursue our desires. Because that's the culture I should be happy with.

And if you were divorced before because you were unhappy, now you are divorced because you could be happier.

And if divorce was the shame of all, today choosing to stay when left is the new shame.

Heather, unable to talk to her friends for fear of being judged that she still loves Nick, gets the same advice wherever she goes. "Stay away from him." Throw your dog over the curb.

And if the situation were reversed, Nick would be in the same situation.

Staying is a new shame.

So why do we continue to have affairs when we can get divorced?

Now, it's common to think that if someone cheats, there's either something wrong with your relationship, or there's something wrong with you.

However, not all millions of people become ill.

The logic goes like this: If your home has everything you need, you don't need to go looking elsewhere, assuming there is a perfect marriage that will prevent you from wanderlust.

But what if passion has a limited lifespan?

What if even a good relationship could never offer something?

What does it mean when happy people cheat?

The vast majority of people I actually work with aren't chronic female friends.

They often hold strong beliefs in monogamy, at least with their partners, in their beliefs.

However, they find themselves conflicted between their values ​​and actions.

They are often people who have actually been loyal for decades, but one day they cross a line they never thought they would cross and risk losing everything.

But what about the little things?

Infidelity is both an act of betrayal and an expression of longing and loss.

At the center of affairs is often a longing or longing for emotional connection, newness, freedom, autonomy, sexual intensity, a desire to reclaim lost parts of oneself, or an attempt to regain vitality in the face of loss or tragedy.

I am thinking of another patient, Priya. She is happily married, loves her husband and doesn't want to hurt him.

But she also says she has always done what was expected of her: being a good child, a good wife, a good mother, and taking care of her immigrant parents.

Priya, she fell in love with an arborist who removed trees from her yard after Hurricane Sandy.

And he's the complete opposite of her in terms of tracks and tattoos.

But Priya's affair, 47, is about adolescence she never experienced.

And her story reinforces to me that when we seek the gaze of others, it is not necessarily our partner that we turn away from, but ourselves.

And we are not looking for others, we are looking for our other selves.

Well, there is a word that people who have an affair in the world always say.

they feel alive.

And they often tell stories of recently deceased parents, friends who died too early, and bad news from doctors.

Death and mortality often lie in the shadows of events as they raise these questions.

Is this it? Anything else?

Will this continue for another 25 years?

Will I ever feel that again?

And perhaps these questions make people cross the line, leading me to wonder if some events are an attempt to fight off death as an antidote to it.

And contrary to what you might think, infidelity isn't about sex, it's about desire for more: the desire to be noticed, to feel special, to feel important.

And the very structure of infidelity, the fact that a lover can never be, keeps you lusting.

It is itself a desire machine. Because imperfection and ambiguity make us want what we can't have.

Now, some people may think that in an open relationship, cheating doesn't happen, but it does.

First of all, conversations about monogamy are not the same conversations about infidelity.

But in reality, even if we are free to have other sexual partners, we still seem to be tempted by forbidden forces. When you do something you shouldn't, you feel like you're doing what you really want to do.

And I've also told quite a few patients that if they could bring into their relationships a tenth of the audacity, imagination, and courage they put into their affairs, they probably wouldn't need to see me.

(Laughter.) So how do you recover from an affair?

Desires are deep inside.

The betrayal runs deep.

But it can be cured.

And some events spell death for relationships that were already moribund.

But others will rock us to new possibilities.

As a matter of fact, the majority of couples who have had affairs stay together.

But some of them just survive, and some can actually turn crisis into opportunity.

They will be able to turn this into a generative experience.

And I actually think even more of a cheated partner, he often says, "You think I didn't want more?"

But I didn't do it. ”

But now that the affair has been exposed, they too have more rights to claim and no longer need to maintain a status quo that may not be working for them.

Because of this new impediment that could actually bring about a new order, many couples find themselves deepening their honest and open conversations in the immediate aftermath of an affair like they haven't had in decades.

And a partner who was previously sexually indifferent suddenly finds himself so greedy that he doesn't know where he came from.

Something about the fear of loss will reignite desire and pave the way for a whole new kind of truth.

So what exactly should couples do when their affair is exposed?

We know from trauma that healing begins when the perpetrator admits their fault.

So for an adulterous partner, for Nick, one is ending the affair, but the other is the essential and important act of expressing guilt and remorse for hurting his wife.

But in fact, I've found that quite a few people who cheat may feel terribly guilty of hurting their partner, but they don't feel guilty about the experience itself.

And that distinction is important.

And Nick, he needs to look after this relationship.

He needs to be a perimeter guardian for a while.

It is his responsibility to bring it up. Because when he thinks about it, he frees Heather of her obsession and of her obligation to ensure that the incident is not forgotten, which itself begins to restore credibility.

But for Heather and her cheated partner, doing something that restores her self-esteem, surrounded by love and friends, is essential to regaining joy, meaning and identity.

But more importantly, curb your curiosity to dig into sordid details -- where have you been? Where have you been?

how often? Is she better than me in bed? -- Questions that only add to the pain and keep you up at night.

Instead, switch to what I call investigative questions: questions that explore meaning and motivation. What did this incident mean to you?

What was there that you were able to express or experience that you cannot do anymore?

How was it when you got home?

What do you value about us?

Are you sure this is the end?

Every infidelity redefines a relationship, and every couple decides what the legacy of infidelity will be.

However, infidelity will continue in the future and will not disappear.

And the dilemma of love and lust does not lead to simple answers: black or white, good or bad, victim or perpetrator.

Betrayal in a relationship can take many forms.

There are many ways we betray our partners, including contempt, neglect, indifference, and violence.

Sexual betrayal is just one way to hurt your partner.

In other words, victims of infidelity are not necessarily victims of marriage.

Well, you've listened to me, and I know what you're thinking: She has a French accent, she must be promoting an affair.

(Laughter) So you are wrong.

i'm not french

(Laughter) (Applause) And I'm not an affair advocate.

However, I am often asked this very strange question because I believe that there are positive consequences from infidelity. “Do you recommend having an affair?”

Now, I don't recommend cheating the way I recommend cancer. Yet, we know that those who get sick often talk about how their illness has brought them new perspectives.

The main question I've been asked since coming to this conference and saying I'm going to talk about extramarital affairs is, do you agree or disagree?

of course. "

(Laughter) I see things from a dual perspective. One is hurt and betrayal, the other is growth and self-discovery. What did it do for you and what does it mean to me.

So when couples come to me after an affair is revealed, I often say: Today in the West, most people will fall in love or get married two or three times, some even with the same person.

The first marriage is over.

Would you like to make the second one together?

thank you.

(applause)

I know you're thinking, "Why can he sit?"

Because this is the radio.

(music) I talk about design on the radio and report on all sorts of stories: buildings and toothbrushes, mascots and directions, fonts.

My mission is to get people involved in design concerns and start paying attention to all forms of design.

When you decipher the world with your design intent in mind, the world becomes kind of magical.

Instead of looking at broken things, we get to see tiny pieces of genius that anonymous designers have worked hard to make our lives better.

And it is, at its core, the definition of design as making life better and providing pleasure.

Nothing gives me more joy than a well-designed flag.

(laughs) Yes!

(Applause.) Congratulations on the 50th anniversary of the Canadian flag.

Beautiful, gold standard.

I'm a bit obsessed with national flags.

Sometimes I bring up the topic of flags, and people react like, 'I don't care about flags,' and then they start talking about flags. Believe me, 100% of people care about flags.

There is something about them that works with our emotions.

This year my Christmas presents were wrapped by my family, including a blue gift bag imitating the Scottish flag.

Sure enough, within the first few minutes of posting this photo online, someone left a comment saying, "You can pick up that Scottish saltire and stick it in your ass."

(Laughter) You see, people are passionate about flags.

That's what it is.

What I love about flags is that if you understand the design of a flag, if you understand what is a good flag and what is a bad flag, you can understand almost any flag design.

So what I'm trying to do here is crack open an episode of my radio show, 99% Invisible, and reconstruct it on stage. So when I press the button over here -- Voice: S is for Sound -- Roman Mars: Sound. So whenever I hear a sound or voice or music, it's because I pushed the button.

Voice: sound.

RM: Okay, okay? please.

3、2。

This is 99% invisible. I'm Roman Maas.

(music) Narrator: Five basic principles of flag design.

Roman Mars: According to the North American Vexilological Association.

Vexilological.

Ted Kaye: Vexilology is the study of national flags.

RM: The extra "lol" sounds weird.

Narrator: First, keep it simple.

The flag should be simple enough for a child to draw from memory.

RM: I didn't even know the city had its own flag until I moved to Chicago in 2005.

TK: Most big cities have national flags.

RM: Well, I didn't know that, by the way, it's Ted Kaye.

TK: Hello.

RM: He's a flag expert and a really great guy.

TK: My name is Ted Kay. He has edited academic journals on flag studies and is currently affiliated with the Portland Flag Society and the North American Veterinary Medical Association.

RM: Ted literally wrote a book on flag design.

Narrator: "Good flag, bad flag."

RM: Rather than a pamphlet, it's actually about 16 pages.

TK: Yes, it's called 'Good Flags, Bad Flags: How to Design a Great Flag'.

RM: So the first city flag I found in Chicago was so beautiful. There is a white field, two blue horizontal stripes, and four red six-pointed stars in the middle.

(Audio) Narrator: The second is to use meaningful symbolism.

TK: The blue stripes represent water, rivers and lakes.

Narrator: The images, colors and patterns of the national flag should be related to what it stands for.

TK: The red star represents an important event in Chicago's history.

RM: So the foundation of Fort Dearborn in Chicago's future location, the Great Chicago Fire, the World's Columbian Exposition that everyone remembers because of the white city, and the Century of Progress Exposition that nobody remembers at all.

Narrator: The third uses 2-3 basic colors.

TK: The basic rule of color is to use 2-3 colors from the standard color set: red, white, blue, green, yellow and black.

RM: The design of the Chicago flag is in complete agreement with the entire cross-section of the city.

it is everywhere. All municipal buildings are flagged.

Witt Moser: There's probably at least one store on every block near where I work that sells some kind of Chicago flag paraphernalia.

RM: It's Whet Moser from Chicago magazine.

WM: For example, today I went for a haircut, and I sat in the barber chair and there was the Chicago flag on the box where the barber kept all his tools, and then in the mirror, there was the Chicago flag on the wall behind me.

As I was leaving, a man passed me in front of him with a Chicago flag badge on his backpack.

RM: Adaptable and remixable.

Especially the hexagram appears everywhere.

WM: The coffee I bought the other day had a Chicago star in it.

RM: It's a clear symbol of Chicago pride.

TK: When police officers and firefighters die in Chicago, they often don't have the American flag in their coffins.

It could be the flag of the city of Chicago.

The flag is so deeply ingrained in Chicago's civic image.

RM: And it's not just that people love Chicago because they love the flag.

Also, I think people will like Chicago more because the flag is so cool.

TK: There is a positive feedback loop between great symbolism and civic pride.

RM: Okay. So when I got back to San Francisco in 2008, I did some research on that flag. I had never seen one in my eight years of living in San Francisco.

And then, unfortunately, I realized that it was sadly missing.

(Laughter) I know.

I get hurt too.

(laughs) TK: So let's start from the top.

Narrator: First, keep it simple.

TK: Keep it simple.

Narrator: The flag should be simple enough for a child to draw from memory.

TK: Relatively complex flag.

RM: Okay then let's go.

A major component of the San Francisco flag is the phoenix, which represents the city rising from the ashes after a devastating fire in the 1850s.

TK: It's a strong symbol of San Francisco.

RM: I'm not very familiar with Phoenix yet.

Design-wise, it's so crude and so detailed at the same time that it's impossible to even try to pursue it, and it just looks bad from a distance, but the deep meaning puts that element on the positive side.

The background behind the phoenix is ​​mostly white with a golden border around it.

TK: It's a very attractive design element.

RM: I think that's fine, but -- (laughter) there are big no-nos in designing flags.

Narrator: Fourth, no letters or stickers.

Never use writes of any kind.

RM: Underneath the phoenix is ​​a ribbon motto that means 'gold for peace, steel for war', and then, and this is the big deal, it says San Francisco.

TK: If you have to write the name of what you represent on your flag, your symbolism is failing.

(Laughter) (Applause) RM: The US flag doesn't say "USA" on the front.

In fact, national flags tend to behave well.

Hats off to South Africa, Turkey, Israel, Somalia, Japan and Gambia.

There are a lot of really great flags out there, but they follow good design principles because the stakes are high.

They are on the international stage.

But city, state and local flags are another story.

(Laughter) There's a barrage of bad flags -- (Laughter) that has to stop.

(Laughter) (Applause) That's the truth, that's the courage.

The first step is to recognize that we have a problem.

(Laughter) A lot of people tend to think that good design is just a matter of taste. To be honest, sometimes it actually does, sometimes it doesn't.

(laughter) Here's a complete list of NAVA flag design principles:

Narrator: Best. TK: Keep it simple.

Narrator: Second. TK: Use meaningful symbolism.

Narrator: Third. TK: I use 2-3 basic colors.

Narrator: Fourth. TK: No letters or stickers.

Narrator: Never use sentences of any kind.

TK: You can't read it from a distance.

Narrator: Fifth. TK: And be distinctive.

RM: All good flags tend to follow these principles.

As I said before, most flags are fine.

But here's the problem. If you show this list of principles to designers of just about anything, they'll tell you these principles: keep it simple, be meaningful, use few colors or be thoughtful about colors, be unique, don't use unreadable text, and all these principles apply to them.

But sadly, US city flags rarely incorporate good design principles.

Our biggest problem seems to be the fourth problem.

We can't stop putting our names on flags and small municipal stamps with small letters.

Municipal seals are designed to be affixed to readable paper, not flags flapping in the wind 100 feet away.

There are also many flags here.

Veterinarians refer to these SOBs as "the seal on the bed sheet." (Laughter.) And if you don't know which city they're going to, yes, that's exactly the problem. Except for Anaheim, apparently they've worked it out.

(Laughter) These flags are all over the United States.

The European equivalent of the city coat of arms is the coat of arms of the city.

Here you can learn a lesson about how to do things right.

This is the coat of arms of the city of Amsterdam.

If this were a US city, the flag would probably look like this:

I agree.

(Laughter) But instead, the Amsterdam flag looks like this.

Instead of putting the entire coat of arms on a plain background and writing "Amsterdam" underneath it, they've taken the essential elements of the escutcheon and the shield and turned them into the most evil city flag in the world.

(Laughter) (Applause) And it's so bad that those flags and crosses are all over Amsterdam, and they're used in the same way as they are in Chicago.

Flags with seals on bedsheets are particularly painful and infuriating to me, but nothing prepares me adequately for one of the greatest train wrecks in veterinary history.

(laughs) Are you ready?

The flag of Milwaukee, Wisconsin.

(Laughter.) I mean, it's characteristic, I give it to them.

Steve Kodis: Hired in 1955.

RM: The city held a contest and attracted a large number of submissions for all kinds of designs.

SK: And then an alderman named Fred Stephen put together some of the paperwork to create the current Milwaukee flag.

RM: The flag on the kitchen sink.

There are giant cog wheels representing industry, ships denoting ports, and giant wheat stalks paying homage to the brewing industry.

It's a terrible mess, and Milwaukee-native graphic designer Steve Kodis wants to change that.

SK: It really sucks.

It's a misstep for the city to say the least.

RM: But the one with the Milwaukee flag on top, which is almost self-parody, has a picture of the Milwaukee Regiment's battle flag from the Civil War.

SK: So having a flag design in the Milwaukee flag is the last element that makes it even more ridiculous.

RM: On the flag. yes. yes.

(Laughter) Right.

(music) Well, Milwaukee is a great city.

I've been there, I love it.

But the most disappointing thing about this flag is that it has had two major redesign contests.

The last time it was held was in 2001.

We received 105 entries.

TK: But ultimately, members of the Milwaukee Arts Commission decided that none of the new entries were worth flying over the city.

RM: They couldn't agree to change that!

(Laughter.) This is discouraging enough to make you wonder if good design and democracy are simply incompatible.

(Laughter) But Steve Kotas is going to try again to redesign the Milwaukee flag.

SK: I think Milwaukee is a great city.

Every great city needs a great flag.

RM: Steve isn't ready to publish the design yet.

One of the key things when proposing these things is that you need to get people involved and then publish the design.

But here's a trick. Awesome flag, if you want to design a great flag like Chicago or DC, start by drawing a 1 by 1.5 inch rectangle on a piece of paper.

Your design should fit within that small rectangle.

Here's why.

TK: A 3 by 5 foot flag standing on a pole 100 feet away looks about the same size as a 1 by 1.5 inch rectangle about 15 inches away from your eye.

Stick to that restriction and you'll be amazed at how attractive and simple your design can be.

RM: Meanwhile, back in San Francisco.

What can we do?

TK: What I'm trying to say is that in every bad flag there's a good flag trying to get out of it.

The way to make the San Francisco flag a good one is to remove the slogan, since it is not readable from a distance.

Removing the name can make the border thicker and more part of the flag.

And I would simply take the phoenix and make it the central big element of the flag.

RM: But Phoenix now, it has to stop.

TK: I would simplify or stylize the phoenix.

It depicts a large, broad-winged bird emerging from flames.

Accentuate the flame.

RM: So this San Francisco flag was designed by Frank Chimero based on Ted Kaye's suggestion.

I don't know what he would do if we were totally free and didn't follow those guidelines.

Fans of my radio show and podcast heard me complaining about bad flags.

They sent me other suggested designs.

This is the work of Neil Mussett.

Both have gotten so much better.

(Laughter) If they were adopted, I think you'd see them all over town.

In my work to make the flags of the world more beautiful, many listeners have considered the possibility of redesigning their own flags and officially adopting them.

(music) If you see your city flag and like it, raise it, even if it violates a design rule or two.

I do not care.

But if you don't see your own city flag, it may not exist, but it might. That's really bad. Please join us in our efforts to change that.

As cities expand, the city flag not only becomes a symbol of the city's location, but it can also become a symbol of how the city thinks about design itself, especially today, when people are becoming more design conscious.

And I think there is more awareness of design than ever before.

A well-designed flag can be seen as an indicator of how the city considers all design systems, such as public transport, parks, and signage.

It may seem frivolous, but it is not.

TK: When city leaders say, "There's more to do than worry about the flag," my response is: “If you have a great city flag, you will have a banner under which people can rally and face the more important things.”

(music) RM: I've seen firsthand what a good city flag can do for Chicago.

The combination of good design and civic pride is needed everywhere.

The best thing about the city flag is that we own it.

These are open source and publicly owned community design languages.

Done well, it's remixable, adaptable, and powerful.

A good flag gives you control over a city's branding and graphic image, but the trade-off of having a bad flag that you don't use is giving up that territory to sports teams, chambers of commerce, and tourism boards.

Sports teams leave and can break our hearts.

Besides, some of us are not very interested in sports.

Also, tourism campaigns can be just plain cheesy.

But a great city flag represents the city to its people and its people to the world at large.

And if the flag is beautiful, so is the connection.

So we could make every city flag as inspiring as Hong Kong, Portland, and Trondheim, we could do away with all the bad flags like San Francisco, Milwaukee, and Cedar Rapids, and finally, when all is done, maybe we could do something about Pocatello, Idaho, which is considered the worst city flag in North America by the North American Veterinary Medical Association.

[Proud to be Pocatello] (Laughter) (Applause) Right.

(Applause.) It's got a trademark on it, folks.

(laughs) It hurts just looking at it.

(laughs) Thank you for your attention.

(Applause) [music by Melodium (@melodiumbox) and Keegan DeWitt (@keegandewitt)]

I would like to see this pencil.

That's the thing. it's legal.

So are the books you own and the cars you own.

They are all legal.

The great apes I see behind me are legal too.

Now you can do legal things.

You can do whatever you want with books and cars.

These great apes, you see.

The photo was taken by a man named James Morrison, who wrote the book "James &amp; Other Apes".

And he tells in his book that all of them, almost all of them, are orphans who have seen their mothers and fathers die before their very eyes.

they are legal.

So for centuries there has been a huge legal wall separating corporations from corporations.

On the one hand, the legal is invisible to judges.

They are not counted by law.

they have no legal rights.

They are incapable of obtaining legal rights.

they are slaves.

Corporations are on the other side of that legal wall.

Corporations are highly visible to judges.

They are counted by law.

They may have many rights.

They have the ability to hold unlimited rights.

And they are masters.

All non-human animals are now legal.

All humans are legal entities.

But being human and being a corporation weren't and aren't synonymous with being a corporation.

Human and corporate are not synonymous.

On the other hand, there have been many humans over the centuries that have been legitimate.

Slavery was legal.

Women and children were sometimes legal.

In fact, much of the civil rights struggle over the past centuries has been about punching holes in that wall and feeding these humans through the wall to get them incorporated.

Unfortunately, that hole has been closed.

Now, the other party is a corporation, but it is by no means limited to humans only.

For example, there are many legal entities that are no longer alive.

We recognize the fact that in the United States, corporations are legal entities.

In pre-independence India, courts ruled that Hindu idols were legal entities and mosques were legal entities.

In 2000, the Supreme Court of India ruled that the Sikh scriptures were legal entities, and as recently as 2012, a treaty was signed between the indigenous peoples of New Zealand and the King, agreeing that rivers are legal entities with their own beds.

Well, I read a book by Peter Singer in 1980. At that time, my head was full of thick brown hair. And indeed, I was moved by the book. I became a lawyer because I wanted to speak for the voiceless and protect the defenseless. And they had no idea how voiceless and defenseless trillions and billions of non-human animals were.

And I started working as an animal protection lawyer.

And by 1985, I realized I was literally trying to achieve the impossible. The reason is that all my clients, all the animals of interest I was trying to protect, were legitimate. they were invisible.

That doesn't work, so I decided the only thing that would work was to move the animals, at least part of them, through a hole that could be re-drilled in the wall, and through that hole start feeding suitable non-human animals on the other side of the corporation.

Now, at that time, the true meaning of animal rights, the idea of ​​giving non-human animals legal status and legal rights, was little known or talked about. And I knew it would take a long time.

So, in 1985, I figured it would be about 30 years before I could launch a strategic litigation, a long-term campaign, to punch another hole in that wall.

What made me pessimistic was that it turned out to be only 28 hours.

So to get started, all we had to do was not only write legal review articles, give classes, write books, but also get down to the meat of how to do that kind of litigation.

So one of the first things we needed to do was understand what the cause of action, or legal cause of action, is.

And legal causes of action are the means lawyers use to make their case in court.

It turned out that there was a very interesting case called "Somerset vs. Stewart" that happened in London about 250 years ago. In this case, black slaves used the legal system to move from corporation to corporation.

I was so intrigued by it that I ended up writing a book about it.

James Somerset was an eight-year-old boy when he was kidnapped from West Africa.

He survived the Middle Passage and was sold to a Scottish businessman named Charles Stewart in Virginia.

Twenty years later, Stewart took James Somerset to London, and after arriving in London, James decided to flee.

So one of the first things he did was to baptize himself. Because I wanted to get a set of godfathers. For eighteenth-century slaves, they knew, one of the main responsibilities of a godmother was to help escape.

Then, in the fall of 1771, James Somerset came into conflict with Charles Stewart.

We don't know exactly what happened, but then James disappeared from sight.

Infuriated, Charles Stewart hired slave catchers to search the city of London, find him, and not return him to Charles Stewart, but took him to the Anne and Mary in London harbor, where he was chained to deck and the ship sailed for Jamaica, where James was sold on the slave market and sentenced to three to five years, the same life as slaves harvesting sugarcane in Jamaica. .

Well, James' godfather got into action.

They lobbied the most powerful judge, Lord Mansfield, who was the presiding judge of the Court of Kingsbench, to demand that he issue a common law writ of habeas corpus on behalf of James Somerset.

Well, common law is the kind of law that an English-speaking judge can enact if not bound by statute or constitution, habeas corpus is called grand writ, capital G, capital W, and is intended to protect those of us who have been detained against our will.

A writ of habeas corpus will be issued.

Detainees must provide legally sound reasons for taking detainees and depriving them of physical liberty.

Well, Lord Mansfield had to make a quick decision. Because if James Somerset is a legal person, he is ineligible for habeas corpus only if he can be a legal entity.

Lord Mansfield, therefore, deciding nothing and assuming that James Somerset was indeed a corporation, issued a writ of habeas corpus and James' body was taken away by the captain.

A series of public hearings followed over the next six months.

On 22 June 1772, Lord Mansfield ordered James' release, using the word "abhorrent" as slavery being so abominable that common law would not support it.

At that moment, James Somerset underwent a legal body modification.

The free men coming out of the court looked exactly like the slaves coming into the court, but as far as the law was concerned they had nothing in common.

The next thing we did was start thinking about what values ​​and principles we wanted to appeal to judges in the Non-Human Rights Project that I founded.

What values ​​and principles they imbibed from their mother's milk, what they were taught in law school, what they practice every day, what they truly believe, and we chose freedom and equality.

Now, liberty rights are the kind of rights that are entitled to how people are put together, and basic liberty rights protect fundamental interests.

And the greatest interest in common law is autonomy and self-determination.

So they are so powerful that in a common law country, even if you go to the hospital and refuse life-saving treatment, the judges will respect your self-determination and autonomy and won't force you to do so.

Now, equal rights are the kind of rights that you are entitled to because you resemble someone else in an appropriate way, and there's a nuisance to that.

I mean, if you are, they have rights, so you are just like them and entitled to rights.

Today, courts and Congress are always drawing the line.

Some are included, some are excluded.

But at the very least you should. The line must be a reasonable means of achieving a legitimate end.

The Inhuman Rights Project argues that drawing the line to enslave autonomous, self-determining beings like the one you see behind me is a violation of equality.

After that, it took me seven years to search 80 jurisdictions and find the one I wanted to file my first lawsuit.

We chose New York State.

We then decided who would be the plaintiffs.

We chose chimpanzees not only because Jane Goodall was on our board of directors, but also because Jane and others have worked intensively on chimpanzees for decades.

We know they have extraordinary cognitive abilities, but they also resemble human abilities.

So we chose a chimpanzee and started searching the world to find a chimpanzee cognition expert.

We found them in Japan, Sweden, Germany, Scotland, England and America. Among them were 100-page affidavits describing more than 40 ways complex cognitive abilities, individually and jointly, lead to autonomy and self-determination.

Now, these include, for example, being conscious.

But they are also aware that they are conscious.

They know they have a heart. They know that others have hearts too.

They know they are individuals and can live.

They understand that they live yesterday and they live tomorrow.

They are doing spiritual time travel. They remember what happened yesterday.

Confining a chimpanzee, especially alone, is very scary because they can anticipate tomorrow.

That's what we do with the worst criminals, and we do the same with chimpanzees without a second thought.

They have some sort of moral capacity.

When they play economic games with humans, they will voluntarily make fair offers even if they don't have to.

They are countless. They understand numbers.

They can do simple math.

They can also participate in language. Alternatively, pay attention to the demeanor of the person you are conversing with and engage in purposeful and referential communication so as not to get into a language war.

they have a culture.

They have a material culture, a social culture.

They have an iconic culture.

In the Thai forests of Ivory Coast, scientists have found chimpanzees using these rocks to crack open the incredibly hard nut shells.

It took them a long time to learn how, and when they excavated the area, they found that this material culture, this way, these rocks had been passed down through 225 generations of chimpanzees for at least 4,300 years.

So now it was necessary to look for chimpanzees.

Two of our chimpanzees were originally found in New York State.

Both will die before we can file a lawsuit.

Then we found Tommy.

Tommy is a chimpanzee. I can see him behind me.

Tommy was a chimpanzee. We found him in that cage.

We found him in a small room full of cages inside a large warehouse in a used trailer lot in central New York.

We found Kiko, who is partially deaf.

Kiko was behind a cement store in western Massachusetts.

And found Hercules and Leo.

They are two juvenile male chimpanzees used in biomedical and anatomical studies at Stony Brook.

we found them

And in the last week of December 2013, the Inhumane Project filed three lawsuits across New York using the same common law habeas corpus argument used against James Somerset, and we asked a judge to issue these common law habeas corpus writs.

We wanted the chimpanzees out, and we wanted Save the Chimpanzees to take us. It's a giant chimpanzee sanctuary in South Florida that contains an artificial lake with 12 or 13 islands -- 2 or 3 acres in size, each housing 20 chimpanzees.

These chimpanzees will then live as chimpanzees with other chimpanzees in an environment that is as close to Africa as possible.

Now all these cases are still ongoing.

We have not yet met Lord Mansfield.

we have to we have to

This is a long-term strategic litigation effort. we have to

In the words of Winston Churchill, our view of the case is that it is not the end, not even the beginning of the end, but perhaps the end of the beginning.

thank you.

(applause)

So would you call me crazy if I said this was a face of pure joy?

I don't blame you because every time I see this arctic selfie, I shudder just a little bit.

I would like to say a few words about this photo.

I was swimming around in Norway's Lofoten Islands just inside the Arctic Circle and the water was just below freezing and floating.

air? With a temperature of -10 degrees and a cold wind, I literally felt the blood rushing out of my hands, feet and face, rushing to protect my vital organs.

It was the coldest I've ever been.

But I realized that this is where I can find great joy, even if my lips are swollen, my eyes are sunken, and my cheeks are red.

Now, when it comes to pain, it is perhaps best described by psychologist Brock Bastian when he wrote, "Pain is a kind of shortcut to mindfulness.

It makes us suddenly aware of everything in our environment.

Like meditation, it inexorably draws us into the sensory perception of virtual worlds. ”

If shivering was a form of meditation, I would consider myself a monk.

(Laughter) Now, before we get to the point, why would anyone want to surf in freezing cold water?

I want to offer a little perspective on what a day in my life could look like.

(music) (video) Man: I mean, I know you were hoping for some good waves, but no one expected that to happen.

I can't stop shivering.

It's very cold.

(music) (applause) Chris Burkard: So you're a surf photographer?

To be honest, I'm not even sure it's a real job title.

When I told them I was quitting my job at 19 to pursue this dream career, my parents definitely didn't think so. Blue skies, warm tropical beaches and year-round tanning.

So for me it was this. Life doesn't get any better than this.

Work up a sweat and photograph surfers at exotic tourist destinations.

But there were so many problems.

You know, the more time I spent traveling to these exotic locations, the less satisfying it seemed.

I set out in search of adventure, but what I found was just the routine.

Wi-Fi, TVs, fine dining, and always-on cellphones, for me, were just traps in and around touristy places, and it didn't take long for me to feel suffocated.

I started to yearn for wild, open spaces, so I started looking for places that others had labeled as too cold, too remote, too dangerous to surf. And I was intrigued by the challenge.

I started this personal movement against the mundane because, if I've ever noticed, even a seemingly glamorous career like surf photography can run the risk of becoming monotonous.

So, while I was searching to break this monotony, I noticed something. Only about one-third of the Earth's surface is covered by warm oceans, which are really just a narrow strip around the equator.

So if you're trying to find the perfect wave, it's probably going to happen in a cold place where the sea is notoriously rough. And that's exactly where I started looking.

And it was on my first trip to Iceland that I felt like I had found exactly what I was looking for.

I was blown away by the natural beauty of the landscape, but most importantly, I couldn't believe that perfect waves could be found in such a remote and rugged part of the world.

At one point, when we got to the beach, there was a huge block of ice on the shoreline.

They created this barrier between us and the waves and we had to walk through this barrier like a maze to get into the lineup.

And when we got there, we were pushing aside chunks of ice trying to catch the waves.

It was an incredible experience and one I will never forget. Because I felt like I had stumbled upon one of the last quiet places in that grim situation where I could find clarity and connection with the world that I could never find on a crowded beach.

I'm obsessed. I'm obsessed. (Laughter) Cold water has always been on my mind, and since then my career has focused on such harsh and unforgiving environments, taking me to Russia, Norway, Alaska, Iceland, Chile, the Faroe Islands and many places in between.

And one of my favorite things about these places was simply the challenge and creativity it took to get there. We spent hours, days and weeks in Google Earth trying to pinpoint remote beaches and reefs that we could actually reach.

And when we got there, the vehicles were just as creative: a snowmobile, a six-wheeled Soviet troop carrier, and some very sketchy helicopter flights.

(laughs) By the way, helicopters are really scary.

There was a particularly bumpy boat ride up the coast of Vancouver Island to such a secluded surf spot, where we were helplessly watched from the water as bears ravaged our campsite.

They walked away with our food and pieces of the tent, clearly letting us know we were at the bottom of the food chain and that this was their place, not ours.

But for me, the trip was a testament to the natural beauty that I traded for touristy beaches.

Well, it wasn't until I traveled to Norway that I really appreciated the cold weather (laughs).

After all, this is where some of the world's biggest and most violent storms send huge waves crashing onto the shoreline.

We were in this tiny, secluded fjord just inside the Arctic Circle.

There were more sheep there than people, so if you needed help you were nowhere to be found.

While I was taking pictures of surfers in the water, it started to snow.

Then the temperature started to drop.

And I said to myself, there is no chance of getting out of the water.

You've traveled this far, so perfect waves and freezing cold are exactly what you've been waiting for.

And even though I couldn't even feel my finger pressing the trigger, I knew I couldn't escape.

So I just did what I could. I shook it off anyway.

But that's when I felt this wind blowing through the valley and hitting me. And what started as a light snowfall soon turned into a full-blown blizzard, and I started to lose track of where I was.

I didn't know if I was drifting toward the sea or toward the shore. All I could really hear was the cries of seagulls and the faint sound of crashing waves.

Okay, I knew this place was notorious for sinking ships and stranded planes, but I started to get a little nervous while floating there.

In fact, I was completely insane -- (laughter) -- and I was borderline hypothermic and eventually had to help my friends get me out of the water.

And I don't know if it started the delirium or what, but later they said I had a smile on my face the whole time.

Well, it was this trip, and perhaps the very experience, that really started to make me feel that every photo is precious. Because at that moment, suddenly, that's what I was forced to earn.

And I realized that all this shivering actually taught me something: In life, there are no shortcuts to joy.

Anything worth pursuing would require a little bit of suffering, and that little bit of suffering I did for photography added value to my work that meant far more to me than just trying to fill the pages of a magazine.

See, I gave a piece of myself in these places, and what I walked away with was the fulfillment I was always looking for.

So let's look at this photo again.

It's easy to see frozen fingers and cold wetsuits and even the struggle to get there, but most of all what I see is just joy.

Thank you very much.

(applause)

In 2011, I spent the last six months of Kim Jong Il's life in hiding in North Korea.

I was born and raised in South Korea, their enemy.

I live in America, another of their enemies.

Since 2002, I have visited North Korea several times.

And I realized that in order to write about it with any meaning, or to understand a place beyond regime propaganda, I had no choice but to fully immerse myself.

There I posed as a teacher and a missionary at a men's college in Pyongyang.

The Pyongyang University of Science and Technology was founded by evangelical Christians working with the regime to educate the sons of North Korea's elite without proselytizing, a crime punishable by death in the country.

The students, 270 young people, were expected to become the future leaders of one of the most isolated and brutal dictatorships in existence.

They became my students when I arrived.

2011 was a special year as it marked the 100th anniversary of the birth of North Korea's first great leader, Kim Il Sung.

To celebrate the occasion, the administration closed all universities and sent students out into the fields to build the much-welcomed ideal of North Korea as the most powerful and prosperous nation in the world.

My students were the only ones who escaped that fate.

North Korea is a prison camp masquerading as a state.

It's all about great leaders.

All books, all newspaper articles, all songs, all TV shows, only one subject.

The flowers bear his name and the mountains are engraved with his slogan.

All citizens always wear the badge of the great leader.

Their calendar also begins with the birth of Kim Il-sung.

The school was a high-security prison masquerading as a campus.

Teachers were allowed to go out only when accompanied by an official administrator on group outings.

Even then, our trips were limited to sanctioned national monuments honoring great leaders.

Students were not allowed to leave campus or contact their parents.

Their day was meticulously planned, and all free time was devoted to honoring the great leader.

Lesson plans had to meet the approval of North Korean officials, all lessons were taped and reported, all rooms were tapped, and all conversations were tapped.

As elsewhere in North Korea, every blank space was covered with portraits of Kim Il Sung and Kim Jong Il.

We were never allowed to discuss the outside world.

As science and engineering students, many of them majored in computers but did not know the Internet existed.

They had never heard of Mark Zuckerberg or Steve Jobs.

Facebook, Twitter, none of them would have made sense.

And I couldn't tell them that.

I went there in search of truth.

But if an entire country's ideology, the everyday reality of its students, and even my own position at the university are all built on lies, where do I even begin?

I started with games.

Playing "Truth and Lies"

A volunteer wrote a sentence on the blackboard and other students had to guess whether it was true or false.

When a student wrote, "I went to China on vacation last year," everyone shouted, "You're lying!"

They all knew this was impossible.

In fact, North Koreans are not allowed to leave the country.

You need a Travel Pass even if you are traveling within your own country.

I expected the game to reveal the truth about the students. Because students lie too often and easily about the mythical feats of great leaders, or the bizarre claim that they cloned rabbits in fifth grade.

The difference between truth and lies seemed vague to them at times.

It took me a while to figure out different types of lies. They either lie to protect their system from the world, or they are told a lie and they just regurgitate it.

Or maybe I lied out of habit.

But if everything they've ever known has been a lie, how can we expect them to be otherwise?

Next, I tried to teach them how to write an essay.

But that turned out to be nearly impossible.

An essay is about coming up with your thesis and making evidence-based arguments to prove it.

But these students were simply told how to think and followed.

Critical thinking was not allowed in their world.

I also gave them a weekly assignment to write a personal letter to everyone.

It took a long time, but eventually some started writing letters to their mothers, friends and girlfriends.

It was just a homework assignment and it was never supposed to reach the other person, but gradually the students began to reveal their true feelings.

They wrote that they were tired of everything being the same.

They worried about their future.

In those letters they rarely mentioned their great leader.

I spent all my time with these young men.

We ate together and played basketball.

They were giggling because I used to call them 'Gentlemen'.

They blushed when they mentioned the girl.

And I came to adore them.

And it was very inspiring to see them open up, even in the smallest of ways.

But I also felt that something was wrong.

During the months I lived in their world, I often wondered if the truth would actually improve their lives.

I wanted to tell them the truth about their country and about the outside world, how young Arabs are using the power of social media to turn a corrupt regime inside out, and how everyone else is connected through the World Wide Web (which wasn't global after all).

But the truth was dangerous to them.

By encouraging them to pursue, I was putting them at risk of persecution and heartbreak.

When you are not allowed to express anything in public, you become very good at reading the unsaid.

In a private letter to me, one student wrote that he understood why I always called them gentlemen.

He said it was because he wanted him to live in peace.

On my last day in December 2011, the day Kim Jong Il's death was announced, their world shattered.

I had to leave without even saying a proper goodbye.

But I think they knew how sad I was for them.

Once, toward the end of my stay, a student said to me: "Master, we never think of you as different from us.

Your circumstances are different, but you are just like us.

We want you to know that we really think you are the same. ”

If I could reply to my students in my letter today, which of course is not possible, I would say: “Dear friends, it has been over three years since we last saw each other.

And now you're 22, maybe 23.

In the last class, I asked if there was anything I wanted.

The only wish you expressed, the only thing you asked of me during the months we spent together, was that I want you to speak Korean with me.

Just once.

I was there to teach you English. I would have known that was not allowed.

But I understood that you wanted to share the bond of our native language.

I called you gentlemen, but I don't know if kindness is a good thing in Kim Jong Un's ruthless North Korea.

I don't want you to lead a revolution. Let other young people make a revolution.

Other countries may casually encourage or hope for something like the North Korean spring, but I don't want you to do anything dangerous. Because I know someone is always watching in your world.

I don't want to imagine what will happen to you.

If I try to contact you and give you some new stimulus, I'd rather you forget about me.

Become a soldier of a great leader and live a long and safe life.

You once asked me if I thought the city of Pyongyang, where you live, was beautiful, but I couldn't give you a straight answer at the time.

But I see why you asked.

Your teacher, I know it was important to you to hear me declare your city the most beautiful, where you have seen the forbidden world.

I know that would make life there a little more bearable, but no, I don't think your capital is beautiful.

It's not because it's drab and specific, but because it's a monster that preys on what it stands for: the rest of the country whose people are either soldiers or slaves.

Only darkness can be seen there.

But I can't hate you because it's your home.

In return, I hope that you, my lovely young gentlemen, will one day help me make it beautiful.

thank you.

(applause)

When I was a kid, I loved playing hide and seek.

But once, when he thought he could climb a tree to find a great hiding place, he fell and broke his arm.

In fact, I started freshman year with a large cast across my torso.

After 6 weeks it was removed and I still couldn't straighten my elbow and had to go through physical therapy where I flexed and stretched my elbow 100 times a day, 7 days a week.

I almost never did it because it was boring and painful. As a result, it took another 6 weeks to get better.

Years later, my mom developed frozen shoulder which led to pain and stiffness in her shoulder.

Someone I believed to have had supernatural powers for half my life suddenly needed help getting dressed and eating less.

She went to physical therapy every week, but like me, she hardly followed the home treatments and it took more than 5 months before she felt better.

Both my mother and I needed physical therapy. This is the process of performing a series of repetitive movements to regain the range of motion lost due to an accident or injury.

A physical therapist works with the person initially, after which the person decides whether to exercise at home.

However, patients find physical therapy tedious, frustrating, confusing, and slow to see results.

Unfortunately, patient non-compliance rates can reach 70%.

This means that the majority of patients do not exercise and therefore take a long time to improve.

All physical therapists agree that special exercises shorten the time needed for recovery, but patients have no motivation to do them.

So, along with three friends who are all software geeks, I asked myself, wouldn't it be interesting if patients could play their own way to recovery?

I started making a PC called MIRA. This Kinect device, a software platform that transforms traditional exercises into video games using a motion capture camera.

My physical therapist has already set a schedule for my specific treatment.

Let's see what this looks like.

The first game asks you to fly a bee up and down to collect pollen and put it in a beehive while avoiding other insects.

Control the bee with elbow extension and flexion just like you did when you were 7 years old out of the cast.

When designing the game, we first talk to our physiotherapist to understand what movements the patient needs to do.

Then turn it into a video game to give the patient simple, motivating goals to follow.

However, the software is very customizable and even allows physical therapists to create their own exercises.

Using software, a physiotherapist recorded himself performing a shoulder abduction. This is one of the movements my mom had to do when she had frozen shoulder.

On the left side of the screen you can follow your therapist's example, and on the right side you can see yourself doing the recommended movements.

I feel more positive and confident because I am doing exercises with my therapist that they think are best for me.

This essentially extends the application to allow the creation of any exercise that a physiotherapist deems optimal.

This is an auction house game for fall prevention, aimed at strengthening muscles and improving balance.

As a patient, I have to sit and stand, and when I stand up, I bid on the items I want to buy.

(Laughter) My grandmother will be 82 in two days, and anyone over 80 has a 50% chance of falling at least once a year, breaking a hip, or worse.

Low muscle tone and poor balance are the biggest causes of falls, so ameliorating these problems through targeted exercise can help older people like my grandmother stay independent safer and longer.

When my schedule is over, MIRA gives me a quick indication of how I have progressed throughout the session.

We introduced three different games for children, adults and seniors.

These can be used for orthopedic and neurological patients, but options for children with autism, mental health, or speech therapy are coming soon.

My physiotherapist can go back to my profile to see the data collected during the session.

She can see how far I've moved, how many points I've scored, how fast I've moved my joints, and so on.

My physiotherapist can use all of these to adapt treatment.

This version is currently being used in over 10 clinics in Europe and the US and we are very happy that we are working on a home version.

We want to enable physiotherapists to prescribe this digital treatment to help patients work towards recovery at home.

If my mom and I had a tool like this when we needed physical therapy, we would have had more success post-treatment and probably got better much quicker.

thank you.

(Applause) Tom Riley: So Cosmin, tell me what hardware they're cleaning up so quickly.

What is it made of and how much does it cost?

Cosmin Milhau: Microsoft Surface Pro 3 for demo, but all you need is a computer and a Kinect ($120).

TR: Yes. Kinect is what people use to play 3D games on Xbox, right?

CM: Yes, but you don't need an Xbox. All you need is a camera.

TR: Well, this is a sub-$1,000 solution.

CM: Sure, for $400, you can definitely use it.

TR: So you're doing a clinical trial in the clinic now?

CM: Yes.

TR: And the hope is to have a home version of it so that I can exercise remotely, and the therapist at the clinic can see how I'm doing and so on.

CM: That's right.

TR: That's cool. thanks so much. CM: Thank you.

Chris Anderson: So I think what we're going to do is use some of the pictures that you've shared with me to talk about your life.

And I think we should start here.

Well who is this?

Martine Rothblatt: This is me and my oldest son, Eli.

he was about five years old.

This was taken in Nigeria right after taking the Washington, D.C. bar exam.

CA: Okay. But this doesn't really look like Martine.

MR: Right. That was who I was as a man and how I was raised.

Before I transitioned from male to female, Martin to Martin.

CA: You were raised as Martin Rothblatt.

MR: Yes.

CA: And about a year after this picture, you married a beautiful woman.

Was it love at first sight? what happened there?

MR: It was love at first sight.

I met Bina at a disco in Los Angeles and then started living together, but the moment I saw her, I saw nothing but an aura of energy around her.

I asked her to dance.

She said she saw an aura of energy around me.

I was a single male parent. She was the parent of one woman.

We show each other pictures of our children and have been happily married for three centuries.

(Applause.) CA: So at the time, you were kind of a hot entrepreneur working on satellites.

You had two successful companies, I think, and then you started to grapple with the question of how to use satellites to revolutionize radio.

Please tell me about it.

MR: Right. I have always loved space technology. Satellites to me are like canoes that our ancestors first pushed into the water.

So it was very exciting for me to participate in the air sea navigation. In developing various types of satellite communication systems, my main focus was on launching larger and more powerful satellites. As a result, receiving antennas are getting smaller and smaller, and I had the idea that if I could make a more powerful satellite through direct TV broadcasting, the receiving antenna could be very small, part of a parabolic antenna, a small flat plate embedded in the roof of a car. Nationwide satellite radio, today's Sirius XM.

CA: Wow. So who used Sirius here?

(Applause) MR: Thank you for your monthly subscription.

(Laughter) CA: Contrary to all expectations at the time, it was a success.

This was a huge commercial success, but shortly afterward, in the early 1990s, there was a big change in your life and you became Martine.

MR: Yes. CA: So tell me, how did that happen?

MR: It happened in consultation with Bina and our four beautiful children. And I discussed with each what I feel my soul has always been and feels as a woman. But I was afraid people would laugh at me if I expressed it, so I always kept it a secret and just showed my male side.

And each of them had different views on this.

Bina said, "I love your soul, and whether the outside is Martin or Martine, it doesn't matter to me, I love your soul."

The son said, "Even if you become a woman, will you still be my father?"

And I said, "Yes, I will always be your father," and I am still his father.

My youngest daughter, at 5, did something really amazing.

She told people, "I love my father and she loves me."

So she had no problem with mixing genders.

CA: And a few years later you published a book called Sex Apartheid.

What was your thesis in this book?

MR: My argument in this book is that there are 7 billion people in the world, and in fact, 7 billion unique ways to express their gender.

And while people may have male or female genitals, genitals do not determine your gender, or even your actual sexual identity.

It is simply a matter of anatomy and reproductive organs, and people can choose the gender they want, unless society forces them into male or female categories, as South Africa once forced people into black or white categories.

Anthropology tells us that race is fiction, even though racism is very real. Cultural studies also show that the distinction between male and female genders is a constructed fiction.

In reality, there is gender fluidity across the entire continuum from male to female.

CA: You don't always feel 100 percent female.

MR: Yes. In a way, you could say that I change my gender as often as I change my hairstyle.

CA: (Laughter) Well, this is your gorgeous daughter, Genesis.

And I think when she was around this age, something pretty scary happened.

MR: Yes, she realized that she couldn't go up the stairs in her house to her bedroom. After months of doctor visits, I was diagnosed with a rare and almost always fatal disease called pulmonary arterial hypertension.

CA: So how did you respond to that?

MR: Well, we first tried to refer her to the best possible doctor.

We finally arrived at the Children's National Medical Center in Washington, D.C.

The head of the pediatric cardiology department said he would refer her for a lung transplant but would be hopeless, especially since there are so few lungs available, especially in children.

He said that everyone who contracted the disease died. If you've seen the movie "Lorenzo's Oil," there's a scene where the main character tumbles down the stairs lamenting the fate of his son, and that's exactly how we felt about Genesis.

CA: But you didn't accept that as the limit of what you could do.

You started researching to see if you could find a cure.

MR: Yes. She was in intensive care for weeks at a time, so Bina and I teamed up to stay in the hospital while the other watched over the rest of the children. When I was in the hospital and she was asleep, I went to the hospital library.

I read every article about pulmonary hypertension.

I never took any biology in college, so I had to go back and forth between biology textbooks, college-level textbooks, and medical textbooks and journal articles, but eventually I knew enough that I thought maybe someone could find a cure.

So we set up a non-profit foundation.

I wrote an explanation asking people to submit a grant. We pay for medical research.

I have become an expert on this disease -- the doctors have told me, Martine, I am very grateful for all the funds you have given us, but it is unlikely that I will find a cure in time to save your daughter.

However, there is a drug developed at Burroughs Wellcome, Inc., which has just been acquired by Glaxo Wellcome, to stop the progression of the disease.

They decided not to develop drugs for rare diseases or rare diseases. Satellite communications expertise could be used to develop treatments for pulmonary hypertension.

CA: So how the hell did you get this drug?

MR: I went to Glaxo Wellcome and after being rejected three times and having the door slammed on the grounds that they weren't going to outlicense the drug to satellite communications experts, they weren't going to send the drug to anyone at all, and they thought I didn't have the expertise, I was finally able to convince a small team to work with me and earn enough trust.

I overcame their resistance, but by the way, they didn't expect this medicine to work, so they said to me, "It's a waste of time.

I am sorry about your daughter. ”

But in the end, they agreed to give me worldwide rights to this drug for $25,000 and an agreement to pay 10 percent of any revenue we might get.

CA: So you've brought this drug to market in a really great way, basically charging the amount you need to make the economy work.

MR: Oh yeah Chris, but this wasn't actually the drug I got—I wrote a check for 25,000 and said, "So where's the Genesis drug?"

They said, "Oh, Martine, there is no medicine for Genesis.

This is what we have tried with rats. ”

And they gave me a small plastic ziplock bag with a small amount of powder.

They said "don't give it to anyone" and handed me a piece of paper that said it was a patent. And then I had to find a way to make this drug.

All 100 chemists at top US universities swore they couldn't turn a small patent into a drug.

Since it has a half-life of only 45 minutes, even if it were to become pharmaceuticals, it would never be delivered.

CA: And then, a year or two later, you got a drug that worked for Genesis.

MR: Chris, what's amazing is that this utterly worthless powder that was a glimmer of hope for Genesis is not only keeping Genesis and others alive today, but it's also generating nearly $1.5 billion in annual revenue.

(Applause) CA: Here you go.

That's why you took this company public, right?

and amassed absolute wealth.

By the way, how much did you pay Glaxo for the $25,000 after that?

MR: Well, every year we pay them 10 percent of $1.5 billion, $150 million, $100 million last year.

This is the best return on investment they've ever gotten. (laughs) CA: And the best news of all is probably this.

MR: Yes. Genesis is a truly wonderful young lady.

Now that she is 30, she is still alive and well.

You can see me, Bina, and Genesis there.

The most amazing thing about Genesis is that she can do anything with her life, but believe me, if you've grown up with people telling you, 'You have a fatal disease' all your life, I'd probably run to Tahiti and never see anyone again.

But instead she chose to work for United Therapeutics.

She says she wants to do everything in her power to make medicine available to others with orphaned diseases. Today, she is the project lead for all telepresence activities, helping to digitally bring the entire company together to find a cure for pulmonary hypertension.

CA: But not everyone with this disease was so lucky.

Many people are still dying, but you are also working on the problem. how?

MR: That's right, Chris. About 3,000 people die from the disease annually in the United States alone, probably ten times that number worldwide, and it continues to die because drugs slow but do not stop its progression.

Lung transplants are the only cure for pulmonary hypertension, pulmonary fibrosis, cystic fibrosis, emphysema, and COPD (Leonard Nimoy just died), but sadly, end-stage lung failure kills nearly 500,000 people a year in the United States, while only 2,000 lungs are available each year.

CA: So how do you deal with that?

MR: So I'm conceptualizing the possibility that, in the same way that we have an unlimited supply of building and mechanical parts to keep cars and planes and buildings running forever, we might not be able to have an unlimited supply of transplantable organs to keep people alive indefinitely, especially those with lung disease.

So we worked with human genome decipherer Craig Venter and the company he founded with XPRIZE founder Peter Diamandis to genetically modify pig genomes so that they are not rejected by the human body, thereby creating an unlimited supply of transplantable organs.

We do this through a company called United Therapeutics.

CA: So, do you really believe that this shortage of transplantable lungs could be cured within decades, thanks to these people?

MR: Of course, Chris.

I'm as confident as I am that direct-to-television Sirius XM was a success.

Actually this is not rocket science.

It is a simple operation that removes genes one after another.

We are so lucky to be born in a time when genome sequencing is a routine activity and the smart people in synthetic genomics can focus on the pig genome to pinpoint the problematic genes and fix them.

CA: But it's not just the body. Although it is surprising.

(Applause.) You're not just interested in long-lasting bodies now.

It is a long-lasting heart.

And I think this graph speaks very deeply.

What does this mean?

MR: The implication of this graph, which comes from Ray Kurzweil, is that the rate of development of computer processing hardware, firmware and software is progressing along a curve, and as we saw in earlier presentations today, by the 2020s we will have information technology that processes information and the world around us at the speed of the human mind.

CA: So you're actually preparing for this world believing that soon we'll be able to actually take out the contents of our brains and somehow store them forever?

How would you describe it?

MR: Well, Chris, what we're working on is creating a situation where people can create a mind file. Mind files are collections of people's habits, personalities, recollections, emotions, beliefs, attitudes, values, all the information we've poured into Google, Amazon, and Facebook today, all stored in them that will allow us to restore consciousness to our mind files in the coming decades, if software can recreate consciousness.

CA: Well, you're not just playing around with this.

I'm serious. I mean, who is this?

MR: This is the robot version of my beloved spouse Bina.

And we call her Vina 48.

She was programmed by Hanson Robotics of Texas.

A National Geographic insert mentions one of her caregivers. She roams the web, documenting hundreds of hours of Bina's mannerisms and personalities.

She's like a two-year-old kid, but she says things that make people wonder. It is perhaps best represented by New York Times Pulitzer Prize-winning journalist Amy Harmon. Her answers are often frustrating, she said, but at times they are as compelling as those of the living people she interviews.

CA: So part of your thinking here, or hope, is that this version of Bina can kind of live forever, or that future upgrades to this version can live forever?

MR: Yes. Not just Bina, but everyone.

As you know, it costs very little to store your mind file on Facebook, Instagram, etc.

I think social media is one of the most amazing inventions of our time. Siri As more and more apps become available that can surpass Siri and develop conscious operating systems, anyone, billions of people, around the world will be able to develop their own mind clones with their own lives on the web.

CA: I mean, Martine, in normal conversation this would sound like a total lunatic, but in the context of your life, what you've been doing, some of the things we've heard this week, the constructed reality our minds give you, you wouldn't bet on it.

MR: Well, I don't think it came from me.

If anything, I am probably the one to tell you a little bit about the work being done by the great companies of China, Japan, India, the United States and Europe.

Tens of millions of people are working to create codes that express more aspects of human consciousness. You don't have to be a genius to understand that all these threads come together to ultimately create human consciousness. That's what we value.

There are many things to do in this life. If we have a digital doppelganger mimetic of ourselves that helps us read, shop, and be our best friend, I believe that a clone of our mind, a digital version of ourselves, will eventually become our best friend. For me personally, and for Bina personally, we love each other like crazy.

Every day we always say, "Wow, I love you more than I did 30 years ago.

So for us, the possibility of mind clones and regenerated bodies means that our romantic relationships could last forever, Chris.

And we never get tired of each other. I'm sure it won't.

CA: Do you think Bina is here? MR: Right.

CA: Too many, I don't know, do you have a handheld mic?

Bina, can I invite you on stage? I just want to ask you one question.

Besides, I have to meet you.

(Applause.) Thank you, thank you.

Come with Martine.

I mean, look, if someone told you when you got married that in a few years you're going to be a woman, and in a few years you're going to be a robot -- (laughter) -- what happened to this?

Bina Rothblatt: It's been a really exciting journey, I didn't think about it at the time, but we set goals, we set those goals, we started achieving things, and before we knew it we were going up and up, and it's amazing because we haven't stopped yet.

CA: Martine said something really nice to me. I just said this on Skype the other day. It's that he wanted to live for hundreds of years as a mind file, but it wouldn't have been possible without you.

BR: Yes, we would like to work together.

We are also cryogenics and want to wake up together.

CA: You know, from my point of view, this is not only one of the most amazing life stories I've heard, but it's also one of the most amazing love stories I've ever heard.

It's a real pleasure to welcome you both to TED.

Thank you very much.

MR: Thank you.

(applause)

So I grew up in Orlando, Florida.

I was the son of an aerospace engineer.

I have lived and breathed the Apollo program.

We watched the launch from our backyard and also took the hour drive to the cape to see it.

Of course, I was impressed with the universe and all of it, but what impressed me most was the engineering put into it.

I see a great view behind me. This is a photo taken from the International Space Station. It shows parts of the Earth that are rarely seen, rarely studied, and seldom explored.

That place is called the stratosphere.

It starts on Earth and goes up and up, getting colder and colder, and when it reaches the beginning of the stratosphere, something amazing happens.

It cools at a fairly slow rate, then begins to warm, then warms and warms until it reaches near-sustainable temperatures (about 0 degrees), and then cools and cools, at the top of the stratosphere.

It is one of the most inaccessible places on earth.

Most of the time, when you visit it, astronauts will blaze towards it at speeds probably several times the speed of sound, take a few seconds on their way up, and then on their way back, this blazing fireball will come back.

But the question I asked is is it possible to stay in the stratosphere?

Is it possible to experience the stratosphere?

Is it possible to explore the stratosphere?

I researched this for quite some time using my favorite search engine, about a year, and then made the dreaded call.

It was a referral from a friend of mine, and I called Tabor McCallum of Paragon Space Development and asked him a question. "Is it possible to build a system that goes into the stratosphere?"

And he said yes.

And after about three years, we've done just that.

And on October 24th of last year, I took off from the ground in this suit and climbed to an altitude of 135,890 feet in a balloon. But who is counting?

(Laughter) It returned to Earth at speeds up to 822 miles per hour.

It was a descent of 4 minutes and 27 seconds.

When he reached an altitude of 10,000 feet, he opened his parachute and landed.

(Applause) But this is really a science story, really an engineering story. What struck me about that experience was that Tabor said, "Yes, I believe we can build a stratosphere suit. Beyond that, let's come tomorrow and talk to the team that formed the core of the group that actually built it."

And they did what I think is important. It's like scuba diving.

So in scuba diving there is a self-contained system.

Everything you need.

You have a scuba tank.

You have a wetsuit.

have visibility.

And that scuba is just this system, and we're going to launch it into the stratosphere.

Three years later, this is where we are.

There is an amazing suit made by ILC Dover.

ILC Dover is the company that made all Apollo suits and all EVA suits.

They never sold suits commercially only to the government, but I am very grateful to them for selling them to me.

There is a parachute here. This was all about safety.

Everyone on the team knew I had a wife and two small children aged 10 and 15 and wanted me to be back safely.

In other words, you have a main parachute and a reserve parachute, and if you do nothing, the reserve parachute will open due to the automatic opener.

The suit itself will protect you from the cold.

This area on the front here has thermal protection.

It actually heats the water that envelops my body.

There are two redundant oxygen tanks.

Even if this suit gets a quarter inch hole, which is very unlikely, this system will protect me from space cyclones.

The main advantages of this system are weight and complexity.

So the system weighs about 500 pounds, and compared to recent stratospheric ascent attempts, they used capsules.

Building the capsule is surprisingly complex, weighing about 3,000 pounds, and lifting 3,000 pounds to a target altitude of 135,000 feet would require a balloon of 45 to 50 million cubic feet.

Since I weighed only 500 pounds with this system, I was able to do it with a balloon that was a fifth smaller, which allowed me to use a dramatically simpler launch system than what would have to be done with a much larger balloon.

I would like to invite you to Roswell, New Mexico on October 24th.

We had a great team that turned up at midnight.

And these are the suits.

Again, this uses the front loader. We will see this in a moment. I would like to play a video of the actual boot.

Roswell is a great place to fly a balloon, but it's also a great place to land by parachute, especially if you're landing 110 miles from where you started.

Behind it is a helium carrier.

It's dark.

I've already been doing pre-breathing for about an hour and a half.

And we see lawsuits happening here.

It takes about an hour to put on the suit.

Astronauts use this very nice air-conditioned van to get to the launch pad, but I got a front loader.

(Laughter) You can see the top. You can see the balloon above.

That's helium.

This is Dave clearing 15 miles of airspace with the FAA.

And go.

(laughs) I'm the one waving with my left hand.

The reason I'm swinging with my left hand is because there's an emergency cutaway on my right hand.

(Laughter) My team forbade me to use my right hand.

So traveling is beautiful. It's like Google Earth turned upside down.

(laughs) It took 2 hours and 7 minutes to climb, but it was the most peaceful 2 hours and 7 minutes.

I was mostly trying to relax.

My heart rate was very low and I was using very little oxygen.

At this point the field in the background is relatively large and you can see me climbing higher and higher.

It's interesting here because, as you can see, I'm right over the airport, maybe 50,000 feet, and I'm about to hit over 190 mph stratospheric winds in no time.

This is what the flight director told me that I had just been in the highest balloon ever and was about 4,000 feet away from liberation.

It looks like this.

You can see the darkness of space, the curvature of the Earth, and the fragile planet below.

I am practicing emergency procedures in my mind now.

I want to be prepared if something happens.

The main thing I want to do here is release and fall and stay perfectly stable.

(Video) Ground control. Are you all ready?

Five. four. three. two. one.

Alan Eustace: A fully inflated balloon is passing by at this point.

You can see Drogue's parachute there. This is very important, so we'll get to it in a moment.

The balloon passes a second time.

Now I'm running at the speed of sound.

There is nothing that can be said to be the speed of sound. Very soon, it will actually reach 822 miles per hour, faster than ever before.

(Video) Ground Control: Lost data.

AE: So I'm at low altitude right now, so you can basically see the parachute coming out right there.

At this point, I am very happy that the parachute came out.

I thought I was the only one who was happy, but it seems that the air traffic controller was really happy too.

The really cool thing about this is the moment you open it. I had a good friend, Bricky, who was in charge of the parachute.

He got on another plane and actually jumped off and landed next to me.

He was my wingman on the descent.

This is my landing, but perhaps it should be more accurately called a crash.

(Laughter) I hate to admit it, but this wasn't even close to my worst landing point.

(Laughter) (Applause) (Video) Man: How are you doing?

AE: Hello!

yay.

(Laughter) So I want to share one thing you may not have seen in this video. But one of the most important parts of the whole thing was the release and what happens immediately after the release.

So what we tried to do was use something called a drogue parachute. The Drogue parachute was there to stabilize me.

I'll show you one of them right now.

If you've ever gone tandem skydiving, you've probably used one of these.

The problem with one of these, however, is that the moment you let go, you're in weightlessness.

So it's very easy for this to turn right around you.

And, without realizing it, you may be entangled, spun, or delayed in releasing this drogue. What happens then is that it descends at 800 miles per hour, and it automatically destroys itself, making it less useful.

But the guys at United Parachute Technologies came up with the idea. It was a roll that looked like it, but look what happens when I pull it out.

It forms a pipe.

This pipe is so solid that there is no chance of it getting tangled when you wrap this drogue parachute around it.

And that avoided a very serious potential problem.

So nothing is possible without a great team of people.

About 20 people worked on it for three years, and they were amazing.

People asked me what was the best part of this whole thing, and it was the opportunity to work with the best experts in meteorology, ballooning, parachute technology, environmental systems and high altitude medicine.

It was great. An engineer's dream is to work with such people.

I also wanted to thank my friends at Google for supporting me during this effort and covering me in my absence.

But there is one more group I would like to thank and that is my family.

yay.

(Applause.) I was giving them constant speeches about technology safety, and they weren't listening at all.

It was very tough on them, but the only reason my wife endured it was because I came home incredibly happy after every 250 test, and she didn't want to take it away from me.

I would like to end with a story.

My daughter Kaitlyn, 15, she and I were in the car driving down the road, and she was sitting there and she had an idea and she said, “Dad, I have this idea.”

So I asked her what she thought and said, 'Caitlin, that's not possible.

And she looked at me and said, "Father, how can you say anything is impossible after what you just did?"

And I laughed and said, "Okay, it's not impossible. It's just very, very difficult."

Then I paused for a moment and said, "Caitlin, it may not be impossible, or even very, very difficult, I just don't know how to do it."

thank you.

(applause)

I am here to tell you about the true search for extraterrestrial life.

That might be nice, but it's not a little green humanoid arriving in a shiny UFO.

But it's a search for planets orbiting distant stars.

Every star in our sky is the sun.

And if our Sun has planets such as Mercury, Venus, Earth, Mars, etc., other planets must and do have planets.

And in the last 20 years, astronomers have discovered thousands of exoplanets.

Our night sky is literally filled with exoplanets.

Statistically speaking, we know that every star has at least one planet.

And in our search for planets, and potentially Earth-like planets in the future, we can help address some of the most amazing and enigmatic questions that humanity has faced for centuries.

why are we here?

Why does our universe exist?

How did the Earth form and evolve?

How and why did life originate and settle on our planet?

A second question we often ponder is, "Are we alone?"

Is there life there?

who is there?

This question has existed for thousands of years, at least since the time of the Greek philosophers.

But I am here to tell you how close I am to finding the answer to this question.

For the first time in human history this is truly within reach.

Now, when we think about the possibility of extraterrestrial life, we are reminded of the fact that our sun is just one of many stars.

This is a photo of a real galaxy. Our Milky Way is thought to resemble this galaxy.

A collection of connected stars.

But our [Sun] is one of hundreds of billions of stars, and our galaxy is one of more than hundreds of billions of galaxies.

We know that small planets are very common, so we just do the math.

And there are so many stars and planets out there that, no doubt, there must be life somewhere.

Well, biologists get furious when I say that. Because there is still no evidence that life exists outside Earth.

Well, if we could look at the galaxy from the outside and zoom in on where the sun is, we would see a true map of the stars.

And the stars highlighted are those with known exoplanets.

This is really just the tip of the iceberg.

Here this animation zooms into the solar system.

Here you can also see planets orbiting the sun and some spacecraft.

Now, imagine going to the west coast of North America and looking at the night sky.

And the constellations appear superimposed, and so many stars and planets are superimposed.

There is a special part of the sky with thousands of planets.

This is where the Kepler Space Telescope has focused for many years.

Zoom in to see one of our favorite exoplanets.

This star is called Kepler-186f.

It is a star system consisting of about five planets.

By the way, we know very little about most of these exoplanets.

We know their size, their orbits, etc.

But there is a very special planet here called Kepler-186f.

Because the planet is not too far from its star, it could be just the right temperature for life.

Here we zoom in on the artist's conception to show what that planet might look like.

As such, many harbor the romanticized notion that an astronomer would go to a lonely mountaintop telescope and gaze at the magnificent night sky through a large telescope.

But in reality, we are just working on our computers like everyone else, getting data by email or downloading it from a database.

So instead of coming here to talk about data and data analysis and the rather tedious nature of the complex computer models we create, I want to explain some of the things we think about exoplanets in a different way.

This is a travel poster. "Kepler 186f: Where the grass on the other side is always red."

That's because Kepler-186f is orbiting a red star, so I'm just speculating that perhaps if there were photosynthetic plants there, they'd have different pigments that would make them look red.

"Enjoy gravity with Super Earth HD 40307g."

This planet is heavier than Earth and has greater surface gravity.

"Relax in Kepler 16b. Your shadow is always with you."

(Laughter) We know there are 12 planets orbiting two stars, but there are probably many more.

If we could visit one of these planets, we would literally see two sunsets and two shadows.

So SF is correct in some respects.

Star Wars Tatooine.

And I have a few other favorite exoplanets that I want to talk about.

This is Kepler-10b, a very hot planet.

It orbits more than 50 times closer to its star than the Earth does to the Sun.

And in fact, it's so hot that we can't visit these planets, but if we could, we'd melt long before we got there.

The surface is hot enough to melt rocks and is thought to contain liquid lava lakes.

Gliese 1214b.

We know the mass and size of this planet, and its density is fairly low.

It's kind of warm, isn't it?

In fact, we don't really know anything about this planet, but one possibility is that it's a watery world, like a magnified version of one of Jupiter's icy moons, which could be 50 percent water by mass.

And in this case, the thick vaporous atmosphere that covers the ocean would not be liquid water, but an exotic form of water that is neither gas nor liquid, a superfluid.

And underneath that would be high-pressure ice forms, such as Ice IX, rather than rocks.

So, out of all these planets out there, we are simply amazed at the diversity, but what we mainly want to find are the planets called Goldilocks planets.

Not too big, not too small, not too hot, not too cold, just right for your life.

But to do that, we must be able to probe the Earth's atmosphere. This is because the atmosphere acts like a blanket that traps heat, a greenhouse effect.

We must be able to assess greenhouse gases on other planets.

Well, SF has some mistakes.

The Star Trek Enterprise had to travel vast distances at incredible speeds to orbit other planets so that First Officer Spock could analyze the atmosphere to see if the planet was habitable or if life existed there.

Well, you don't have to travel at warp speed to see the atmospheres of other planets, but I don't mean to keep up-and-coming engineers from thinking how to do that.

We can and do actually study planetary atmospheres here from Earth orbit.

This is a Hubble Space Telescope photo taken by the Shuttle Atlantis on departure after the last manned spaceflight to Hubble.

In fact, they installed a new camera that we use to observe the exoplanet's atmosphere.

And so far, we have been able to study the atmospheres of dozens of exoplanets, about six of them in great detail.

But they are not small planets like Earth.

It's a big, hot planet, so it's easy to see.

we are not ready We do not yet have adequate technology to study small exoplanets.

But nevertheless, I wanted to explain how we study the atmospheres of exoplanets.

Imagine a rainbow for a moment.

If you look closely at this rainbow, you can see that some dark lines are missing.

And here is our sun. The white light of our Sun was split up by a spectroscope, not by raindrops.

And you can see all these dark vertical lines.

Some are very narrow, some are wide, and some are shaded at the edges.

And indeed, this is how astronomers have literally studied the heavenly bodies for more than a century.

So here each different atom and molecule has a special set of lines, a fingerprint, so to speak.

And that's how we study exoplanet atmospheres.

And I will never forget how many people told me when I started studying exoplanet atmospheres 20 years ago.

We will never be able to study them. why bother? ”

That is why I am happy to tell you about all the atmospheres that are currently being studied. This is truly a field of its own.

So what kind of gas will we look for in other planets, other Earths, when we can observe them in the future?

Our Earth's atmosphere contains 20 percent oxygen by volume.

It means that there is a lot of oxygen.

But without plants and photosynthetic life, there would be no oxygen in our atmosphere, virtually no oxygen.

In other words, oxygen exists because of the existence of life.

And our goal is to look for gases present in the atmospheres of other planets, gases that could be attributed to life.

But which molecules should we search for?

In fact, I told you how diverse exoplanets are.

It is expected that this will continue even if other Earths are found in the future.

That's one of the main things I'm working on right now, and I have a theory about it.

Almost every day, I recall receiving an e-mail from someone with a bizarre theory about gravitational physics, cosmology, and so on.

So please don't email me your crazy theories.

(Laughter) Well, I had my own crazy theory.

But who are the MIT professors going to?

Well, I emailed the Nobel Laureate in Physiology or Medicine and he said, "Of course, come and talk to me."

So I took two of my biochemistry friends and went to talk about our crazy theory.

And the theory was that life produces all the little molecules, so many molecules.

I was not a chemist, for all I could think of.

please think about it. There are so many gases, including carbon dioxide, carbon monoxide, molecular hydrogen, molecular nitrogen, methane, and methyl chloride.

They exist for other reasons, but life alone produces ozone.

So we went to talk to him about this and he immediately denied the theory.

He found an example that doesn't exist.

So we go back to the drawing board and think we've found something very interesting in another area.

But coming back to exoplanets, the point is that life produces so many different kinds of gas, literally thousands of them.

So what we're doing now is just trying to figure out which types of exoplanets and which gases could be responsible for life.

So even if gas is found in the atmosphere of an exoplanet, we don't know if it's produced by intelligent aliens, by trees and swamps, or even by simple single-celled microbes.

So working on models and thinking about biochemistry is all well and good.

But the really big question we face is "how?"

How do we find these planets?

In fact, there are many ways to find planets, and several different methods.

But what I am most interested in is how we can open the gateway so that we can find hundreds of earths in the future.

We have a serious chance of finding traces of life.

And in fact, I just finished directing a two-year project on this very special stage of a concept called Starshade.

And a starshade is a very peculiar shaped screen whose goal is to fly the starshade so that it blocks the light of the stars so that the telescope can see the planets directly.

Here you can see me and two team members lifting one small piece of star shade.

It looks like a giant flower, but this is one of the prototypes of petals.

The concept is that the starshade and telescope activate together and the petals unfold from their stowed position.

The central truss expands and the petals snap into place.

Now, this literally means you have to make the petals very precisely in microns, and you need to unfold them in millimeters.

And the entire structure must fly tens of thousands of kilometers away from the telescope.

The diameter is about tens of meters.

And the goal is to block the starlight with incredible precision so that we can see the planets directly.

And because of the physics of refraction, it has to be a very specific shape.

Now, this is a real project that we literally worked so hard to believe.

To convince you that it's more than just a movie format, here are some actual photos of the second-generation Starshade deployment test bed in our lab.

And in this case, I wanted you to know that the central truss has remnants of a large space-deployable radio.

So what do we find out after all the hard work of thinking about all the crazy gases that could be out there and building the most complex space telescopes that could be out there?

Well, in the best case, another extraterrestrial image will be found.

Here the Earth is depicted as a pale blue dot.

And this is in fact a real picture of Earth taken by the spacecraft Voyager 1 from 4 billion miles away.

And that red light is just scattered light in the camera optics.

But what's pretty cool to think about is that if there were intelligent aliens orbiting a star close to us, and they built a complex space telescope of the kind we're trying to build, all they'd see would be this pale blue dot, a needle of light.

So when I sometimes stop and think about my professional struggles and big ambitions, it's hard to compare it to the vastness of the universe.

But despite this, I dedicate the rest of my life to finding another Earth.

And I can assure you that the next generation of space telescopes, the second generation, will have the ability to locate and identify other Earths.

And the ability to split starlight allows us to look for gases in the atmosphere to assess greenhouse gases, estimate surface temperatures, and look for signs of life.

But that's not all.

Finding Other Planets Like Earth In this case, we are creating a new kind of map of nearby stars and planets orbiting around them, including [planets] that could actually be habitable by humans.

And I imagine that hundreds of years from now our descendants will embark on interstellar travel to other worlds.

And they will look back on us all as the first generation to discover an Earth-like world.

thank you.

(APPLAUSE) JUNE COHEN: Now for Fred Jansen, Rosetta Mission Manager.

Fred Jansen: You said halfway through that the technology to actually see the spectrum of an exoplanet like Earth doesn't exist yet.

When is this expected and what do we need?

In fact, what we're looking forward to is something called the next-generation Hubble telescope.

This is called the James Webb Space Telescope and is scheduled to launch in 2018. That's what we're trying to do. We will observe a special kind of planet called a temporary exoplanet. This will be the first attempt to study small planets for gas that may indicate that the planet is habitable.

JC: As a generalist, Sarah, I would like to ask you one additional question.

So I was really struck by the objections you faced in your career, the idea that when you started thinking about exoplanets, there was extreme skepticism about their existence in the scientific community, and you proved it wrong.

What did it take to undertake it?

SS: Well, as scientists we should be skeptical. Because it's our job to make sure what they're saying actually makes sense.

But being a scientist, as you've learned from this session, it's kind of like an explorer.

You are full of curiosity, stubborn, and have a resolute will to move forward no matter what others say.

JC: I love it. Thank you Sarah.

(applause)

I learned some of the most important life lessons from drug dealers, gang members and prostitutes. Also, some of the deepest theological conversations took place on street corners at 1:00 a.m. on Friday nights, not in the sacred halls of seminaries.

I'm a Baptist minister, seminary trained, and have been a church pastor for over 20 years, so this is a little unusual, but it's true.

This was part of my participation in the Public Security Crime Reduction Strategy, which has seen a 79% reduction in violent crime in major cities over eight years.

But I didn't start out wanting to be part of someone's crime reduction strategy.

I am 25 years old and went to church for the first time.

If you had asked me what my ambition was, I would have said I wanted to be a megachurch pastor.

I wanted a church with 15, 20,000 members.

I wanted to do my own TV service.

I wanted my own clothing line.

(Laughter) I wanted to be your long haul carrier.

All nine yards.

(Laughter) After about a year as a pastor, my membership increased by about 20 members.

So Megachurch Dam was a long way off.

But seriously, what if I asked, "What are your ambitions?"

I would simply say that I could be a good pastor, be with people throughout their lives, preach messages that have everyday meaning to them, and represent the communities I serve in the African-American tradition.

But in my city and throughout metropolitan areas, and most of the metropolitan areas in the United States, something else was happening. That is, the murder rate began to rise sharply.

And then there were young people who were killing each other for reasons that seemed very trivial to me, like bumping into someone in the high school hallway and shooting him dead after school.

A person in the wrong color shirt is on the wrong street corner at the wrong time.

And something needed to be done about it.

It got to the point where it started to change the character of the city.

For example, if you go to a housing project like the housing project down the street from my church and walk inside, it's like a ghost town. Because of the violence, the parents wouldn't let their children play outside even in the summer.

At night, when you hear it in your neighborhood, it sounds like fireworks to the layman's ear, but it was gunshots.

I heard this sound almost every night when I was cooking dinner, telling bedtime stories to my kids, or just watching TV.

And go to any hospital emergency room and you'll see young black and Latino men on stretchers shot to death.

And I had a funeral, but not that of a respected patriarch or patriarch who lived a long life and had a lot to say.

I was conducting funerals for children aged 18, 17 and 16. I was standing in churches and funeral homes struggling to say something that would have any meaningful impact.

So while my colleagues were building great and tall cathedrals, buying land outside cities, and moving congregations to create and recreate the City of God, the social fabric of the city center was sagging under the weight of this violence.

So I stayed because someone needed to do something, so I saw what I had and went ahead with it.

I started preaching denouncing community violence.

And so I started looking at programs for my church and started building programs to catch at-risk youth, people who were on guard against violence.

I also tried to be innovative in my preaching.

Have you ever heard of rap music?

rap music?

Once, I even tried to preach by rapping.

It didn't work, but at least I tried.

I will never forget the young man who came to me after that sermon.

He waited until everyone was gone and said, "Pastor, is it a rap sermon?" And I thought, "Well, what do you think?"

And he said, "Don't do it again, Reverend."

(Laughter) But I preached and built these programs. And I thought maybe if my colleagues did the same it would make a difference.

But the violence got out of control and people who were not involved in the violence started being shot. People buying cigarettes at the convenience store, people sitting at the bus stop waiting for the bus, children playing in the park, violence comes unaware of the violence happening on the other side of the park.

Things were out of control and I didn't know what to do, but then something happened that changed everything for me.

It was a kid named Jessie McKee who was walking home with her friend Rigoberto Carrion to a housing project down the street from my church.

They encountered a group of gangster youths in Dorchester and were murdered.

But Jesse was mortally wounded, ran in the direction of my church, and died some 100, 150 yards away.

If he had arrived at the church, the lights would have been out and nothing would have changed. nobody was home.

And I took it as a sign.

When I caught these young people, to my surprise, they were my age, but there was a big chasm between us.

It was like being in two completely different worlds.

So, as I pondered all this and saw what was happening, I suddenly realized that a contradiction had arisen within me. Here's the contradiction: In all of my sermons condemning violence, I was also talking about building community, and suddenly I realized that there are certain segments of the population that I have not included in my definition of community.

And here was the contradiction. If I really wanted the community I preach, I had to reach out and embrace this group that I had left out of my definition.

It meant reaching out and embracing those perpetrating acts of violence, gangbangers and drug dealers, rather than building programs to catch those who crossed the border of violence.

As soon as I realized that, one question came to my mind.

why me?

I mean, isn't this a law enforcement issue?

This is why there are police, right?

The question immediately arises: "Why me?" Even when it came, the answer came immediately: why me? I can't sleep at night when I think about it.

Because I'm starting to realize that I'm the one looking around that someone has to do something about this, and that someone is me.

I mean, wouldn't the movement start anyway?

It doesn't start with a big convention where people get together and make a statement in unison.

But it starts with just a few people, or perhaps one.

That's how I started out, so I decided to try and figure out the culture of violence where violent young people exist, and started volunteering in high school.

After about two weeks of volunteering in high school, I realized that the young people I was trying to reach were not in high school.

I started walking in the community, but the rocket scientists noticed they weren't out during the day.

So I started walking down the road late at night, going to the parks where they were and starting to build the relationships I needed.

A tragedy strikes Boston, rallying many of the clergy. And there were a few of our cadres who realized they had to come out from the four walls of the sanctuary and meet the young people where they were, rather than try to figure out how to bring them in.

So we decided to walk together. On Friday and Saturday nights at 10:00 pm we gathered in one of the most dangerous neighborhoods in the city and walked until 2:00 or 3:00 am.

I think we were pretty insane when we first started walking.

So we weren't drug dealers.

We were not drug guests.

We weren't the police. Some may wear collars.

It was probably really weird.

But after a while they started talking to us. And they kept an eye on us while we walked and wanted to make sure of a few things. First, we intend to be consistent in our actions, and we keep showing up. And second, they wanted to make sure we weren't trying to exploit them.

Because there were always people who said, "Take back the streets," but they always seemed to have TV cameras or reporters with them, and they were promoting their reputation to the detriment of those in the streets.

So they saw that we had nothing of the kind and decided to talk to us.

And we have done amazing things for preachers.

We decided to listen without preaching.

Come on, give up for me

(Laughter) (Applause) Okay, come on, cut in my time, okay? (Laughs) But it was amazing.

We told them, 'We don't know our community after 9pm, between 9pm and 5am, but you know.

You are, as it were, the subject matter expert of the time.

So talk to us. teach us

Help us see what we don't see.

Please help us understand what we don't understand. ”

And they were all very happy about it. And we got an idea of ​​what life was like on the streets, very different from what we see on the 11 o'clock news and portrayed in general and even social media.

And as we spoke with them, many myths about them were dispelled with us.

And one of the biggest misconceptions was that these kids were ruthless, ruthless, and uncharacteristically daring.

What we discovered was just the opposite.

Most of the young people on the streets are just trying to make it on the streets.

And it turns out that some of the most intelligent, creative, wonderfully wise people we've ever met were engaged in struggle on the streets.

I think some of them call it survival, but I call them conquerors. Because being able to live each day in the situation they find themselves in is an overcoming.

As a result, we said to them: "What do you think of this church, how do you think this organization is helping this situation?"

And we made a plan while talking with the young people.

We stopped seeing them as problems to solve, and started seeing them as partners, assets, and allies in the fight to reduce violence in their communities.

Imagine making a plan. There's a pastor at one table and a heroin dealer at the other thinking about how the church can help the whole community.

The Boston miracle was to bring people together.

I had other partners.

We had law enforcement partners.

We had a police officer in our house.

It wasn't the entire unit, as some still had that rock 'em up spirit, but there were other officers who saw honor in working with the community and felt it was their responsibility to be able to partner with community and faith leaders to reduce violence within the community.

So do probation officers, judges, and people who have been in the upper echelons of law enforcement. Because they, like us, have come to the realization that they will never be arrested, that there will never be enough prosecutions, that the prisons will never be filled enough to alleviate the problem.

Twenty years ago, I helped found a faith-based organization to address this issue.

I left that city about four years ago and started working in 19 cities across the country. What I found was that there was always a member of the community leaders in those cities who had their heads down and their noses to the grindstone. They checked their egos at the entrance, thought the whole was greater than the sum of the parts, and found a way to band together and work with the young people on the streets. The solution is not to increase the number of police officers, but to dig up assets in the community and form a strong community. Elements of cooperation on violence reduction.

Now in the United States, I am very proud of the youth movement that is tackling the structural problems that need to change for the betterment of society.

But there are political ploys that try to pit police brutality and police misconduct against black-on-black violence.

But it's fiction.

It's all connected.

When you think about decades of failed housing policies and poor educational structures, when you think about persistent unemployment and underemployment in your communities, when you think about poor medical care, when you think about drugs and guns in duffel bags, it's no wonder you see a culture of violence like this emerging.

And the response coming out of the states is more police and more crackdowns on hotspots.

It's all connected, and one of the great things we've accomplished so far is demonstrating the value of community, law enforcement, the private sector, and cities working together to reduce violence.

We have to value the element of community.

We believe we can end the era of urban violence.

I believe it is possible and people still do it.

But I need your help.

It doesn't just come from people trying to burn out in the community.

they need support. they need help.

go back to your city

Find those people.

"Need help? I can help."

Find those people. they are there

Bring your organization together by working with law enforcement, the private sector and the city, with one goal of reducing violence, but make sure there is a strong community component.

Because the old saying in Burundi is true. "What you do for me is what you would do for me without me."

god bless you. thank you.

(applause)

Someone who looks like me passes you on the street.

Do you see them as mothers, refugees, or victims of oppression?

Or do you think they are cardiologists, lawyers, or local politicians?

Are you looking at me top to bottom and wondering how hot it will get or did my husband force me to wear this outfit?

What would happen if you wrapped a scarf like this?

I can walk down the street wearing the exact same clothes, but what the world expects of me and how I will be treated is determined by this arrangement of fabric.

But this is no new monologue about the hijab. Because the Lord knows that a Muslim woman is more than a piece of cloth with which to choose whether to wrap her head.

This is about looking beyond your own prejudices.

What if I walked past you and later found out that I was actually a race car engineer, designed my own race cars, and ran a college race team, because it's true.

What if I told you that I actually trained as a boxer for five years, because it's true.

Are you surprised?

why?

After all, folks, that surprise and the behavior that comes with it is the product of what we call unconscious prejudice, or implicit prejudice.

And the result is a ridiculous and detrimental lack of employee diversity, especially in high-impact areas.

Hello, this is the Commonwealth of Australia Cabinet.

(Applause.) First, unconscious bias is not the same as conscious discrimination.

I'm not saying there's a sexist, racist, or ageist lurking inside all of you waiting to come out.

That's not what I mean.

We all have prejudices.

They are the filters through which we see the world around us.

I am not blaming anyone, prejudice is not blaming.

Rather, it is something that needs to be identified, recognized and mitigated.

Prejudice can be about race, or it can be about gender.

It can be about class, education, or disability.

In fact, we all have prejudices about what is different and what is different from social norms.

The problem is that if we want to live in a world where the circumstances of our birth do not determine our future and where equal opportunities are ubiquitous, each of us has a role to play in ensuring that our lives are not swayed by unconscious bias.

In the 1970s and 1980s there was a very famous experiment in the field of unconscious bias and gender.

In other words, orchestras at that time were mostly made up of men, with only up to 5% women.

And apparently, it's because men played differently, perhaps better.

However, in 1952 the Boston Symphony began experimenting.

They started blind auditions.

Therefore, it should be performed behind a screen instead of an in-person audition.

Interestingly, the change was not registered immediately until we asked the auditionees to remove their shoes before entering the room.

Because the sound of heels clattering on the hardwood floor and clattering was enough to keep the women away.

Now look at this, audition results showed a 50 percent increase in a woman's chances of making it through the preliminary stages.

And that nearly tripled their chances of getting in.

What does it tell us?

Unfortunately for the men, it wasn't that the men actually played differently, but there was a perception that they thought they did.

And that prejudice was determining their outcome.

So what we're doing here is identifying and recognizing that bias exists.

And look, we're all doing it.

Let's take an example.

A son and his father were in a terrible car accident.

The father died on impact and his son was taken to hospital with serious injuries.

When the surgeon arrived, he looked at my son and said, "I can't operate on you."

why?

"That boy is my son."

How is that possible?

Folks, the surgeon is his mother.

Now, raise your hand - that's fine - but raise your hand if you first thought the surgeon was male?

There is evidence that unconscious bias exists, but we all need to acknowledge it exists and consider ways to move beyond it and seek solutions.

One of the interesting things in the field of unconscious bias is the topic of quotas.

And this is often brought up.

And among the criticisms there are also thoughts about this merit.

You know, I don't want to be picked because I'm a chick, I want to be picked because I have merit, I'm the best for the job.

This is a pretty common sentiment among the female engineers I work with, and I know that too.

And yes, I have been there.

But if the idea of ​​merit is true, why, in a 2012 Yale experiment, where identical resumes were sent to lab technicians, Jennifers was considered less competent, less likely to be offered the job, and paid less than Johns?

Unconscious bias exists, but we have to figure out how to overcome it.

And, interestingly, there is a study that describes why this is the case, called the paradox of merit.

And this is kind of ironic, in an organization that talks about competence being the main value driver when it comes to who they hire, they are more likely to hire men, and more likely to pay them more, because competence is clearly a masculine quality.

But hey.

So you guys read me and think you know what's going on.

Can you imagine me doing any of these things?

Can you imagine me walking in and saying, "Hey guys, this is how it is. This is how it works."

Well, I would be happy if you could do that.

(Applause) Guys, that's my day job.

And the great thing about this work is that it is very interesting.

In fact, in places like Malaysia, Muslim women on drilling rigs aren't even worth commenting on.

It's a lot.

But it's interesting.

I remember saying to one of the guys, "Hey, look, I want to learn how to surf."

And he said, "Yasmin, I don't know how you can surf with all that gear, and I don't know any women-only beaches."

And the guy had a great idea and said, 'You run Youth Without Borders, right?

Start a clothing line for Muslim women on the beach.

You could call it youth without board shorts. ”

(Laughter) And I was like, 'Thank you guys.

And I remember another guy telling me that I should eat yogurt as much as possible. Because that's the only culture I go there.

The problem, however, is that this is true to some extent, given the marked lack of employee diversity, especially in high-impact locations.

Well, in 2010, the Australian National University conducted an experiment in which they submitted 4,000 identical applications for essentially entry-level jobs.

A Chinese would have to send 68% more applications to get the same number of interviews as someone with an Anglo-Saxon name.

If you were a Middle Easterner, Abdel Majid, you would have had to transfer 64 percent, but if you're Italian, you'd be pretty lucky and only have to transfer another 12 percent.

In places like Silicon Valley, things aren't so good.

At Google, they publish diversity results, 61 percent white, 30 percent Asian, and 9 percent black, Hispanic, and so on.

And other countries in the tech industry haven't improved that much either, and they admit it, but I'm not really sure what they're doing about it.

The problem is that it doesn't drip.

More than half of the FTSE 100 companies do not have a non-white leader at the board level, whether executive or non-executive, according to a study conducted by Green Park, a senior executive supplier in the UK.

And two out of three have no executives from minorities.

And most minorities at such levels are non-executive directors.

Therefore, their influence is not that great.

I have said many terrible things.

You're thinking, "Oh my God, this is terrible. What am I going to do about it?"

Fortunately, it turned out to be a problem.

Opportunities are scarce, but they are due to unconscious bias.

But you may be sitting there thinking, "I'm not brown. What does that have to do with me?"

We will propose a solution.

And, as I said before, we live in a world of idealism.

And if we want to create a world where the environment we were born into doesn't matter, we all need to be part of the solution.

And interestingly, the author of the Lab Resume experiment offered a solution of sorts.

She said the only thing that united successful women, the one thing they had in common, was the fact that they had good mentors.

Mentoring is a phrase that everyone has heard at least once, and it is expressed in words.

Here is another challenge for you.

I challenge each of you to coach someone different.

please think about it.

We all want to mentor someone who is familiar with us and who has shared experiences.

When I see a Muslim woman with a bad attitude, I think, "What's wrong? I can go out with you."

If you walk into a room and see someone who goes to the same school and plays the same sport, you are more likely to want to help that person.

But for those in the same room who don't have common experiences with you, that connection can be very difficult to find.

The idea of ​​finding another mentor, someone who doesn't have the same background as you, is opening doors to people who couldn't even walk down the hallway, whatever that background might be.

Because, ladies and gentlemen, the world is not fair.

People are not born with equal opportunities.

I was born in Khartoum, one of the poorest cities in the world.

I was born brown, born female, and born Muslim, but in this world they are very suspicious of us for reasons beyond my control.

But I also accept the fact that I was born privileged.

I was born to wonderful parents, educated and blessed to move to Australia.

But I've also been blessed with wonderful mentors who have opened doors I didn't even know existed.

A mentor told me: "Your story is interesting.

Write something about it so you can share it with people. ”

"I know you guys don't deserve the Australian rig, but come anyway," said the leader.

And I'm talking to you here.

And it's not just me.

There are all kinds of people in my community who are helped by mentors.

A young Muslim man in Sydney eventually started a poetry slum in Bankstown with the help of a leader, and now it's a big deal.

And he can change the lives of many other young people.

Or a refugee Afghan woman here in Brisbane who spoke little English when she came to Australia, but whose mentors helped her become a doctor and won our Young Queenslander Award in 2008.

She is a source of inspiration.

This is not very smooth.

this is me.

But I'm also the woman who wore the rig's clothes, and the woman who wore the abaya in the first place.

If you had seen me in another version, would you have chosen to guide me?

Because I'm human too.

We must overcome our unconscious biases and find leaders who are the opposite of ourselves. Because structural change takes time and I don't have the patience for it.

So if we want to make a difference and create a world where everyone has that opportunity, choose to open the door to people.

Because, while you may think diversity is not your thing, we are all part of this system and we can all be part of the solution.

If you don't know where to find someone different, go somewhere you wouldn't normally go.

If you're enrolled in private high school tutoring, you might want to attend your local state school or stop by your local refugee tutoring center.

Or maybe you work in an office.

Get rid of new graduates who look totally out of place. Because it was me. And open the door for them. Because we are not victims, not just in a formal way. But show them the opportunity. Because in opening up your world, you find yourself accessing doors they didn't even know existed, and they didn't even know they had.

Ladies and gentlemen, our community has a problem of lack of opportunity, especially due to unconscious bias.

But each of you has the potential to change that.

I'm sure you've been given a lot of challenges today, but I hope you'll take this one piece and think about it a little differently. Because diversity is magic.

And I recommend forgetting the first recognition. Because they are probably wrong.

thank you.

(applause)

The FBI is involved in more domestic terrorist plots in the United States than any other organization.

More than Al Qaeda, more than Al Shabab, more than Islamic State, more than all of them combined.

This is probably not how you think about the FBI.

You probably think of FBI agents shooting bad guys like John Dillinger or arresting corrupt politicians.

After the 9/11 terrorist attacks, the FBI lost interest in gangs and rogue elected officials.

The new target was a terrorist, and the FBI was keen to track down terrorists.

The agency spends $3.3 billion annually on domestic counterterrorism efforts.

Compare that to just $2.6 billion combined for organized crime, financial fraud, official corruption, and all manner of other traditional criminal activities.

After years of researching the case files of terrorism prosecutions in the United States, I have come to the conclusion that the FBI is far better at creating terrorists than catching them.

In the 14 years since 9/11, there have been about six actual terrorist attacks in the United States.

These include the 2013 Boston Marathon bombings and the failed attempt by a man named Faisal Shahzad to deliver a car bomb to Times Square.

But in the same 14 years, the agency has boasted about how it thwarted dozens of terrorist plots.

The FBI has arrested more than 175 people in total in counterterrorism sting operations.

These operations, usually led by informants, provide the mentally ill and financially despaired people with the means, the opportunity, and sometimes even the idea, to become what we now call terrorists.

After 9/11, the FBI was given a "never again" edict.

Never attack the American mainland again.

FBI agents were instructed to spot the terrorists before they struck.

To do this, agents recruited a network of over 15,000 informants across the country looking for potentially dangerous individuals.

Informants can earn over $100,000 every time they bring a terrorist case to the FBI.

Yes, the FBI primarily pays criminals and crooks in six figures to spy on U.S. communities, most of which are Muslim-American communities.

These informants arrest people like Abu Khalid Abdul-Latif and Wali Mujahid.

Both are mentally ill.

Abdul Latif has a history of committing suicide by smoking petrol.

Mujahid had schizoaffective disorder and had difficulty distinguishing between reality and fantasy.

In 2012, the FBI arrested these two men on charges of conspiring to raid a military recruiting center outside Seattle with weapons provided by the FBI, of course.

The FBI informant was convicted rapist and child molester Robert Childs, who was paid $90,000 for his work on the case.

This is not an outlier.

In 2009, an FBI informant who fled Pakistan on murder charges led four men in plotting to blow up a synagogue in the Bronx.

The lead defendant was James Cromity, a bankrupt Walmart employee with mental health issues.

And the informant offered $250,000 if he joined the conspiracy.

There are many other examples.

Today, The Intercept published my new article on a counterterrorism sting case in Tampa involving Sami Osmackak, a young man who lived near Tampa, Florida.

Osmakaku also suffered from schizoaffective disorder.

He was also bankrupt and had no ties to international terrorist organizations.

Nevertheless, an FBI informant got him a job, gave him money, introduced him to an undercover agent posing as a terrorist, and lured him into an Irish bar bombing plot.

But what's interesting here is that the lead undercover agent (whose face is blurred in this photo) returns to the Tampa field office with a recording device.

Behind closed doors, FBI agents admitted what they were doing was a farce.

Federal judges don't want you to hear about these conversations.

He sealed the records and put them under a protective order to prevent someone like me from doing this.

Behind closed doors, the Squad Supervisor, the lead investigator, described the terrorist candidate as "a retarded idiot who has no place to urinate."

They described his terrorist ambitions as wishful thinking and pipe dream.

But that didn't stop the FBI.

They provided Sami Osmacak with everything we needed.

They gave him a car bomb, gave him an AK-47, helped him make a so-called martyrdom video, and even paid for a taxi to take him wherever he wanted to go.

During the investigation, the squad overseer tells the agents they wanted a Hollywood ending.

And he had a Hollywood ending.

Sami Osmackak attempted to deliver what he believed to be a car bomb, but was arrested, convicted, and sentenced to 40 years in prison.

Sami Osmakak is not alone.

He is one of more than 175 so-called terrorists for whom the FBI has prepared a Hollywood ending.

US officials are calling it the War on Terror.

It's really just a theater, a theater of national security, with mentally ill people like Sami Osmakaku unwittingly playing actors in carefully choreographed productions brought in by the FBI.

thank you.

(Applause) Tom Riley: So these are pretty strong accusations, pretty strong accusations.

How can I backup this?

Trevor Aaronson: My research began in 2010 with a grant from the University of California Research Reporting Program. Berkeley, a research assistant, and I put together a database of all terrorism prosecutions of the time in the first decade after 9/11.

And we used court documents to find out whether the defendants had any connections to international terrorist groups, whether informants were used, and whether informants provided the means and opportunities to act as provocateurs.

And we turned it over to the FBI and asked them to respond to our database.

If they believed there was something wrong, we asked them to tell us what it was and come back and check, and they never challenged our findings.

I then used that data in a magazine article and subsequent book, and was once again offered the opportunity to say, "Trevor Aaronson's findings are wrong," when appearing on shows like CBS and NPR.

And they never stepped forward and said, "There are problems with these findings."

As such, this data has since been used by groups like Human Rights Watch in recent reports on this kind of sting operation.

And so far, the FBI has never really responded to these accusations that they can pretend to be terrorists in this kind of sting operation because they aren't actually catching terrorists, they're catching mentally ill people.

TR: So The Intercept is a new investigative journalism website co-founded by Glenn Greenwald.

Tell us about your article and why.

TA: The Intercept seemed like the most logical place for this. Because my article does take advantage of the fact that a source leaked to me records of these private FBI conversations that were sealed by federal judges, based on government claims that their disclosure would irreparably damage the law enforcement strategy of the U.S. government.

So places like The Intercept have been established to protect and expose journalists dealing with such highly sensitive issues.

So my article in The Intercept, just published today, goes into more detail about how Sami Osmackak got stuck in an FBI undercover operation.

The talk could only emphasize what they said, such as calling him a "retarded fool."

But it was much more elaborate, and they went to great lengths to keep the funds in the hands of Sami Osmakach, who used them to buy weapons from undercover agents.

When he was brought to trial, the central evidence was that he paid for these weapons, but in fact, these records show how the FBI engineered an essentially mentally ill and bankrupt individual to raise money for the weapons and charge the money for conspiracy.

TR: One last question.

Less than 10 days later, the FBI arrested several ISIS suspects in Brooklyn, claiming they might be heading to Syria, but were they real or similar examples?

TA: Well, so far all we know is what has been revealed in court documents, but they seem to suggest that this is another example of the same case.

This kind of sting operation has migrated into different areas.

So what started as an Al-Qaeda conspiracy, now has Islamic State in its current flavor.

What is notable about this case is that the three indicted men began their conspiracy to go to Syria after being referred to an FBI informant, who in fact helped them complete the necessary travel documents.

In a somewhat comical twist in the case, one of the defendant's mothers learned that the defendant was interested in going to Syria and had hidden his passport.

Therefore, even if he showed up at the airport, it is unclear whether he could have gone anywhere.

Yes, there are people in the United States who may be interested in joining Islamic State. They are the people the US government should investigate to see if they are interested in violence here.

In this particular case, the evidence so far suggests that the FBI allowed them to go ahead with their plans to go to Syria, even though they weren't close to going to Syria in the first place.

Well, I've been drawing for a long time and usually a drawing like this should be easy for me.

I am in southern Ethiopia. I am with Dasanaha.

I have a large family, very beautiful trees, and I am taking these pictures with this very large, very cumbersome, very clumsy technical plate film camera.

Anyone know 4x5 and 10x8 films? I have it set up on a tripod.

I have family and spent most of the day talking to them.

They kind of understand what I'm thinking.

They think I'm a little crazy, but that's another story.

And for me the most important thing is beauty and beauty, which is based on light.

So the lighting is set to my left, balanced in communication with Dasanaha, a family of 30 people of all ages.

There's a baby, there's a grandparent, I'm taking them to a tree, I'm waiting for the light to go down, and it's going on, and there's one piece of film left, and I think, I'm fine, I'm in control, I'm in control.

Set up and set up and the light is about to go out. I want it to be golden, I want it to be beautiful.

I want it to hoist over the horizon and illuminate all the glory that could be bestowed upon them.

And then it's almost over, almost over, and I got the sheet in the camera, everything was in focus, and suddenly there was a big 'bang' and I looked around and in the corner up in the tree one of the girls slapped the girl next to her and the girl next to her pulled her hair and all hell broke loose and I stood there and said, 'But light, light.

Hold on, I need the light. Stay still! Stay still! ”

And they started screaming, and one of the men turned around and started screaming, screaming, and the whole tree fell down, not the tree, but the people who were in the tree.

They were all screaming and running around and fled to the village in this cloud of smoke and I was left there standing behind a tripod.

I brought a sheet, but the lights went out, so I can't take pictures.

where have they gone? I had no idea.

It took me a week to make the picture you see here today. I'll tell you why. (Applause) It's very, very, very easy. I spent a week walking around the village and visiting all the villages. "Hello, can I meet you at the tree?"

what is your story who are you? "

And it all turned out to be about a boyfriend who cried a lot.

I mean, I have teenage kids. I should know

It was about my boyfriend. The eldest girl kissed the wrong boy and a fight started.

And there was a very, very beautiful lesson for me in that regard. I had to understand them if I was going to photograph these people and put them on a pedestal with the dignity and respect that I intended.

It didn't just stand up. It wasn't just a handshake.

It wasn't just saying, "I'm Jimmy, I'm a photographer."

I had to know them all, down to who their boyfriend was and who was allowed to kiss who.

Eventually, after a week, I was completely exhausted, and I mean, I got down on my knees and said, 'Please, go back to that tree.

That's the picture I have to take. ”

they are all back. I put them all back in the tree.

I made sure the girls were in the right position and one of the girls I slapped was there.

They certainly looked at each other. When I looked later they were looking at each other so angrily and I had the wood and everything, but at the last moment I said, "Goat, goat!"

We need something visible. We need a white goat in the middle. ”

So I replaced all goats. I put in a goat.

But still I was wrong. Because, as you can see on the left, another little boy hurried away because I didn't pick his goat.

Therefore, I, a moral being, must learn to speak Goat like Dasanah.

But anyway, the effort put into that picture and the story I just told you, you can imagine, there are hundreds of strange and quirky stories of hundreds of other people around the world.

And this was about four years ago, and I've been on a very extravagant trip to be honest.

I'm a real romantic. I'm an idealist and maybe naive in a way.

But I truly believe that there are beautiful people on earth.

It's very, very simple. It's not rocket science.

I wanted to put these people on a pedestal.

I wanted to put it on a pedestal like you've never seen it before.

So we have selected about 35 different groups, tribes and indigenous cultures.

These were chosen purely for aesthetic reasons, which we will discuss in more detail later.

I'm not an anthropologist, nor have I done any professional research on the subject, but I have a very, very, very deep passion for it. And we believe it was necessary to select the most beautiful people on the planet, in the most beautiful environments they lived in, and bring those two together to bring you all together.

About a year ago, when we published our first photos, something very exciting happened.

The whole world came rushing in and it was a strange experience. Because everyone in the world is asking, "Who are they? What are they? How many are they?"

Where did you find them? Are they real? you faked it

teach. teach. teach. teach me please. ” There are millions of questions, and to be honest, I don't have the answers.

I really didn't have the answers and, well, they're beautiful, I kind of understood that was my intention, but I couldn't answer the questions that were posed to me.

It's really funny, about a year ago someone said, "You're invited to a TED talk."

And I said, "Ted? Ted? Who's Ted? I've never met Ted."

He said, "No, it's a TED talk." I said, "But who is Ted?"

Should I talk to him or should I sit with him on stage? ”

And I said, "No, no, it's a TED group. You should know about it."

And I said, "I have been living in teepees and yurts for the last five years.

How do we know who Ted is? Introduce him. ”

Anyway, long story short, he said, "I have to do a TED talk."

Researched. Oh, it's exciting. That is wonderful!

And it ends up going to TEDGlobal.

Even more exciting.

But what you have to do is teach your people a lesson, a lesson learned by traveling the world with your tribe.

I wondered if I had learned a lesson, well, what? good question.

three. It takes three lessons and should be very deep.

(Laughter) So I thought, well, let's think about three lessons.

(Applause.) So I pondered. I stood here two days ago and did a test. I had a card and a clicker in my hand and a picture of me on the screen. After taking three lessons, he began to present them. And I had a very strange out-of-body experience.

I looked at myself standing there and said, 'Oh, Jimmy, this is a bunch of cod.

All of these people sitting here have told more stories and heard more lessons in life.

Who are you to tell them what you have learned?

Who are you to guide them, who are you to show them what is right, what is wrong, what these people are saying? ”

And I went through a little bit, it was very private and a bit of a meltdown.

I came back and left very displeased like a boy walking away from a tree with a goat, it didn't work, it wasn't what I wanted to say.

And as I pondered over it, I realized that all I could convey was the very basics.

You have to turn it around.

There's only one person here that I know, and that's me.

I'm still getting to know myself and this is a journey of a lifetime and I probably won't find all the answers. However, I have learned some amazing things on this journey.

So what I'm trying to do is share my lessons with you.

As I explained at the beginning, this is a very extravagant, very personal thing, and I leave it up to you, the viewer, to interpret how I made these pictures and why these lessons mean to me and what they probably mean to you.

I traveled a lot when I was a child.

I was very nomadic. It was actually very exciting.

All over the world, I felt like I was being shoved at breakneck speed to become someone, to become that individual, Jimmy.

Go to Earth, so I run, run, and my wife teases me sometimes, "Jimmy, you look a bit like Forrest Gump," but I'm like, "No, it's all for something, believe me."

So I kept running, and I kept running, and I got somewhere and I stood there and looked around and I thought, where do I belong? where do i fit in?

what am i where do i come from I had no idea.

So I hope there aren't too many psychologists in this audience.

Perhaps part of this journey is about me trying to find my place.

So while you go, don't worry, I wasn't when I arrived with the tribe, I didn't paint myself yellow or run around in these spears and loincloths.

But what I found were people who belonged to me, they were extraordinary people who inspired me. And I would like to introduce some of my heroes.

they are free

Well, the Huri are some of the most extraordinary and beautiful people on the planet.

they are proud They live in the highlands of Papua New Guinea.

There are very few of them left, but they are called Furi's Wigmen.

And images like this, I mean, this is everything for me.

And you spent weeks and months there talking to them and getting there, and I want to raise them up on a pedestal and I said, 'You have something that not many have seen.

You are sitting in this wonderful nature. ”

And it really looks like this, and they really look like this.

This is the real deal.

And do you know why they are proud? Do you know why they look like this and why I literally bent over to photograph them and show them to you?

Because they have a special ritual.

And the Huri people have this ritual. When you become a teenager and become a man, you have to shave your head. And they spend the rest of their lives shaving their heads every day. And what they do with that hair, they make it a creation—a very personal creation.

It's their creation. It's their free work.

That is why they are called Furi's Wigmen.

That's the wig on his head.

It's all made out of his human hair.

Then, decorate the wig with bird of paradise feathers. Don't worry, there are plenty of birds out there.

Few people live there so don't get too upset, they spend the rest of their lives recreating these hats and going further and further, it's something extraordinary, there's another group, they're called columns, they live in the next valley, but they speak a completely different language, they look completely different, they wear hats, and it's made of scarabs, these wonderful emerald green little scarabs, sometimes 5,0 There are 00 or even 6,0 00 scarabs inside this hat and they spend their whole life collecting these scarabs to make this hat.

So Hui was an inspiration to me.

Perhaps I should make more of an effort to find the rituals that matter to me and go back in time to see where I really fit in.

A very important part of this project was how to photograph these extraordinary people.

And it's basically beauty. I think beauty is important.

We spend our lives revolving around beauty: beautiful places, beautiful things, and ultimately beautiful people.

It's very, very, very important.

I have spent my entire life analyzing what I look like.

Am I perceived as beautiful?

Does it matter if I am beautiful or is it purely based on my aesthetics?

And when I set off, I came to a very narrow conclusion.

Excuse me, do I have to travel the world to photograph women between the ages of 25 and 30? Is that what beauty is all about?

Does it matter before and after?

That was until I started traveling. The trip was so extreme that I still shudder when I think about it.

I've been to parts of the world and I'm not sure if anyone has heard of the Chukchi. Has anyone heard of the Chukchi?

The Chukchi are probably still on planets that are still alive, technically, as far as humans can go.

13 hours by plane from Moscow.

Arrive in Moscow first, from which it takes 13 hours by direct flight.

And it's a matter of getting there.

As you can see, some people miss the runway.

And when you land there, the Chukchi will have Chukchi.

The Chukchi are the last indigenous Inuit people of Siberia. I'd heard about them but had seen very few images, but I knew they were there. And kept in touch with this guide. And this guide said: "We have this wonderful tribe. They only have about 40 people.

No problem. we find them ’ So we started this journey.

When we got there, after a month's journey across the ice to get to them, we weren't allowed to photograph them.

They said, "You can't take pictures of us. We have to wait."

You'll have to wait until you find out about us. We have to wait until they understand us.

We'll have to wait until we find out how we interact with each other. ”

And it wasn't until many weeks later that I felt a sense of respect.

They had zero judgment.

They observed each other from youth to middle age to old age.

they need each other.

Adults have no teeth, so children have to chew meat all day long, but at the same time, children take frail elderly people to the toilet. That's why this wonderful respected community exists.

And they worshiped and admired each other and really taught us what beauty is.

(Applause) Now, I would like to ask for a little interaction with the audience.

This is very important at the end of my talk.

If you look at the person on your right or left, I want you to observe them and compliment them. This is very important.

It doesn't matter if it's their nose, hair, or aura, just look at them and give them compliments.

I'm running out of time, so please hurry.

And you have to remember that.

Well, thank you, thank you, thank you, we complimented each other.

Hold on tight to that compliment. hold for later.

And finally, a very serious one, it happened just two weeks ago. Two weeks ago I returned to Himba.

Now, the Himba people live in northern Namibia on the border with Angola, and I have been there several times before, presenting them with this book I made, showing them pictures, arguing with them and saying,

This is how I honor you. What do you think? am i right? am i wrong? "

That's why I wanted this discussion. It was very, very, very emotional. One night we were sitting around a campfire. I think I drank a little too much, to be honest. And I sat under the stars and said, 'This is great, you've seen a picture of me, we love each other. (Laughter.) And I was a little late, so I looked around and thought maybe the fence was gone, I said.

Wasn't there a fence here last time you came?

There was a big security fence around the village, and they looked at me and it was like they said, 'Yeah, the village chief is dead.'

And I thought, okay, the chief is dying, yes look up at the stars again, look at the campfire.

Chief dead. What does Chief Die have to do with fences?

"Captain dies.

Shall we destroy it first? Then we reflect.

Then rebuild. Then we respect. ”

And suddenly I burst into tears. Because my father had just passed away before this trip, and I had never acknowledged him or thanked him for the fact that I might be standing here today because of him.

These people taught me that we owe what we are to our parents, grandparents, and the long line of ancestors before them. And I didn't know that until two weeks ago, no matter how romantic and idealistic this trip was.

I didn't know until two weeks ago.

So what is this all about?

Well, I have an image I want to show you. It's a pretty special image, but it wasn't inherently the image I wanted to pick.

I was sitting there the other day and I have to finish with a strong image.

Then someone said, "I have to show you a picture of the Nenets. It's the Nenets."

Okay, but it wasn't my favorite photo.

She said, "No no no no no, it's a great picture.

You are reflected in his eyes. ”

"What do you mean I'm in his eyes? It's a picture of the Nenets," I said.

She said, "No, look closely. You're in his eyes."

And if you look closely at this photo, you can see me in his eyes. So maybe he has my soul and I'm in his soul. While these pictures are looking at you, I ask you to look at them.

He may not see you in his eyes, but there is something special about these people.

As I said earlier, I don't have the final answer, but I have to. There must be something there.

So, if you could briefly review what I was talking about about beauty, belonging, and our ancestry and roots, I'd love for you all to stand by me.

(Laughter) I have no more excuses. It's almost noon. Don't worry, it's not a standing ovation. I'm not looking for compliments.

But you were complimented a few minutes ago.

Now I want you to grow taller.

I want you to take a breath. Here's what I say.

I won't get down on my knees for two weeks.

I won't ask you to bring goats, and I know you don't have camels.

Pictures have tremendous power.

It's this language that we all understand now.

We all really get it. We have this world-class digital fireplace, right? But I want to share you guys with the world. Because you are also a tribe.

You're from the TED tribe, right? But that compliment must be remembered.

Stand tall and breathe in through your nose. Then I will take a picture of you. have understood?

I need to take a panorama shot, so it will take a minute, so I have to concentrate.

Take a breath, stand tall and don't laugh. Shi, please breathe through your nose.

I'm going to take a picture.

(click) Thank you.

(applause)

Mark Twain summed up in one witty word what I consider to be one of the fundamental problems of cognitive science.

“There is something fascinating about science,” he said.

In fact, such a small investment can yield such a large return. ”

(Laughter) Twain was joking, of course, but he was right. There is something fascinating about science.

Some bones suggest the existence of dinosaurs.

From the spectral lines, the composition of the nebula.

From fruit flies, genetic mechanisms, and reconstructed images of the blood flowing through the brain, or in my case the behavior of very young children, we are trying to say something about the basic mechanisms of human cognition.

Specifically, in my lab at the Massachusetts Institute of Technology's Department of Brain and Cognitive Sciences, I've spent the last decade trying to understand the mystery of how children learn so much from so little.

Because it turns out that the fascination with science is also the fascination with children. To paraphrase Mark Twain a little more gently, it is precisely the ability of children to quickly and accurately derive rich abstract inferences from sparse and noisy data.

I'll show you just two examples today.

One concerns the problem of generalization and the other concerns the problem of causal inference.

And speaking of my lab work, this work is inspired by an area that I am grateful for.

I am grateful to my leaders, colleagues and collaborators around the world.

Let's start with the problem of generalization.

Generalizing from small samples of data is the foundation of science.

We conduct polls on a small percentage of voters to predict the outcome of national elections.

We conduct clinical trials to see how a small number of patients respond to treatment and then bring the drug to the national market.

However, this only works if the sample is randomly drawn from the population.

If our sample is rigorously selected in some way, for example, if we only survey urban voters, or if we only enroll men in clinical trials for the treatment of heart disease, the results may not be generalizable to the broader population.

So scientists care whether the evidence is randomly sampled, but what does that have to do with babies?

Well, babies should always generalize from small data samples.

They watch a few rubber ducks and learn that they float, or watch a few balls and learn that it bounces.

And they have an expectation about ducks and balls that they intend to extend to rubber ducks and balls for the rest of their lives.

And babies have to generalize about ducks and balls, say about shoes and ships, sealing wax, cabbage, kings, and pretty much everything else.

So do babies care whether the small pieces of evidence they see are plausible representations of the larger population?

Let's check.

Show two movies, one from each of the two conditions of the experiment. Since you're only going to watch two movies, you'll only see two babies. And any two babies are different from each other in countless ways.

But these babies stand in for groups of babies here, of course, and the differences observed from this represent the average group differences in baby behavior per condition.

In any movie, you're going to see babies doing exactly what you would expect them to do. And you can hardly make babies more magical than they are now.

But what I think is magical, and what I want you to notice, is the contrast between these two conditions. Because the only difference between these two movies is the statistical evidence that babies observe.

Show the babies a box with blue and yellow balls. My then graduate student and now colleague at Stanford University, Hyowon Gweon, pulls out three blue balls in a row from this box. And when she pulls those balls out, she squeezes them and they make a squeaky noise.

If you're a baby, it's like a TED talk.

It doesn't get any better than that.

(Laughter) But the point is, it's pretty easy to pull three blue balls in a row out of a box of mostly blue balls.

You can do it even with your eyes closed.

This is probably a random sample from this population.

And if you can randomly put your hand in a box and pick out something that makes a squeaking noise, chances are everything in the box will squeak.

So maybe babies should also expect the yellow ball to squeak.

Well, these yellow balls have funny sticks on the ends so your baby can do other things with them if he wants.

They could hit them and hit them.

But let's see what the baby does.

(Video) Hyowon Kwon: Do you want to see this? (ball squeaks) Did you see it? (Ball squeaks) Cool.

can you see this?

(ball squeaks) Wow.

Laura Schultz: I told you. (laughter) (video) HG: See this? (Ball squeaks) Hi Clara, this is for you. You can go ahead and play.

(laughs) LS: You don't even have to talk, do you?

Well, it's great that babies generalize blue ball qualities to yellow balls, and it's impressive that babies can learn from our imitation, but we've known those things about babies for a very long time.

A really interesting question is what happens when you show a baby exactly the same thing. There's a secret compartment out of which we actually pull the ball, so we can guarantee it's exactly the same, but this time we're only changing the apparent population from which that evidence was extracted.

This time, show your baby how to get 3 blue balls out of a box of mostly yellow balls.

Randomly draw 3 blue balls in a row from a box of mostly yellow balls [probably not].

It is not plausible, randomly sampled evidence.

This evidence suggests that perhaps Hyowon was sampling the blue ball on purpose.

Maybe there's something special about the blue balls.

Perhaps only the blue balls squeak.

Let's see what the baby does.

(Video) HG: See this? (Ball squeaks) Can you see this toy? (Ball squeaks) Oh, that was cool. look? (ball squeaks) Come on, this is what you play. You can go ahead and play.

(uproar) (laughter) LS: So you've seen two 15-month-old babies behave quite differently based solely on the observed sample probabilities.

Let me show you the results of my experiment.

The vertical axis shows the percentage of babies who grabbed the ball in each condition. As you can see, babies are much more likely to generalize evidence when it is plausibly representative of the population than when the evidence is clearly hand-picked.

And this leads to pleasant predictions. Suppose you take a single blue ball out of a mostly yellow box.

It is [probably impossible] to randomly pick 3 blue balls in a row from the yellow box, but you can randomly sample just one blue ball.

It's not an improbable example.

And if you could just randomly put your hand in the box and pick out something that creaked, then probably everything in the box would creak.

So there is much less evidence of babies squeaking, and there is much less behavior to mimic in this one-ball state than in the state we just saw, but we expected babies themselves to squeak more, and that's exactly what we found.

So in this regard, 15-month-old babies are just as scientist as they care about whether evidence is randomly sampled, and they use that to develop their expectations about the world. That is, what sounds and what doesn't, what to look for, what to ignore, and so on.

Here's another example. This time it's a matter of causal inference.

And it starts with the confusing evidence problem that we all have that we are part of the world.

And while this may not seem like a problem to you, like most problems, it only becomes a problem when things go wrong.

Take this baby for example.

Things are not going well for him.

He wants to move this toy, but he can't.

I'll show you a clip of a few seconds.

And there are two possibilities. Perhaps he is doing something wrong. Another thing might be that there's something wrong with the toy.

So in our next experiment, we're going to give babies a little bit of statistical data that supports one hypothesis more than others, and see if they can use that to make different decisions about what to do.

Here is the setup.

Hyowon tries to make the toy a success.

Then I try twice and fail both times, and Hyowon tries again and succeeds. That sums up my relationship with a technical graduate student as a whole.

But the point here is that we do have a little bit of evidence that the problem isn't with toys, it's with people.

Some people can move this toy, some people can't.

Well, when a baby gets a toy, he gets to make a choice.

Mom is right there so you can go ahead and give her a toy to change the person, but there is also another toy on the edge of that cloth, and you can also pull the cloth towards you to change the toy.

Now let's see what the baby does.

(Video) HG: 2, 3. go! (music) LS: One, two, three, go!

Arthur, I'll try again. One, two, three, go!

YG: Arthur, let's try again, shall we?

One, two, three, go! (music) Look at that. Remember these toys?

Can you see these toys? Yes, I will put this here and give this to you.

You can go ahead and play.

LS: Okay Laura, but of course babies love moms.

Of course, babies give toys when mom can't move them.

Again, the really important question is what happens when you change the statistical data slightly.

This time, the baby sees the toys work and ends up failing in exactly the same order, but with a modified distribution of evidence.

This time, Hyowon will succeed once and fail once, and so will I.

And this suggests that it doesn't matter who tries this toy, the toy is broken.

It doesn't always work.

Again, babies have choices.

With her mother right next door, she can change mates, and another toy is provided at the edge of the cloth.

Let's see what she does.

(video) HG: Two, three, go! (music) I'll try again. One, two, three, go!

Hmm.

LS: I'll try, Clara.

One, two, three, go!

hmm i will try again.

One, two, three, go! (music) HG: I'll put this here and give this to you.

You can go ahead and play.

(Applause) LS: Let me show you the results of the experiment.

The vertical axis displays the distribution of children's choices in each condition, showing that the distribution of choices children make depends on the observed evidence.

Thus, in the second year of life, babies can use just a little statistical data to decide between two fundamentally different strategies for acting in the world: asking for help and exploring.

I've shown you two of literally hundreds of lab experiments that make similar points. Because what really matters is that children's ability to make rich inferences from sparse data underlies all the species-specific cultural learning we do.

Children learn new tools from just a few examples.

They learn new causal relationships from just a few examples.

They also learn new words, in this case American Sign Language.

I would like to finish with just two points.

If you've been following my world, the field of brain and cognitive science, over the past few years, you've noticed three big ideas.

The first is that this is the age of the brain.

And indeed, neuroscience has made some surprising discoveries. These include localization of functionally specialized regions of the cortex, clearing of the mouse brain, and activation of neurons by light.

The second big idea is that we are in the era of big data and machine learning, and machine learning will revolutionize our understanding of everything from social networks to epidemiology.

And perhaps it can teach us something about human cognition in addressing scene comprehension and natural language processing problems.

And the last big idea that you've probably heard is that it's probably a good idea for us to know so much about the brain and have access to so much big data. Because when left to our own devices, humans are error prone, take shortcuts, make mistakes, make mistakes, are biased, and misunderstand the world in countless ways.

I think these are all important stories and they can tell you a lot about what it means to be human, but I want you to be aware that the one I told you today is a completely different story.

This is a story about the mind, not the brain, and specifically about the kinds of computations that the human mind is uniquely capable of performing, including rich, structured knowledge and the ability to learn from small amounts of data that are evidence of just a few examples.

And basically, this is a story about how we get the world right, starting as a young child and continuing through the great achievements of our culture.

Folks, the human mind does not only learn from small amounts of data.

The human mind thinks of completely new ideas.

The human mind produces research and discovery, the human mind produces art and literature, poetry and drama, and the human mind cares for other human beings: the old, the young, and the sick.

We even heal them.

The next few years will see more innovation than I can imagine, but it's highly unlikely that we'll even see anything that matches the computational power of a human child in my or any of your lifetimes.

If we invest in these most powerful learners and their development, babies and children, mothers and fathers, caregivers and teachers, just as we invest in other most powerful and elegant forms of technology, engineering and design, we will not only dream of a better future, but plan for it.

thank you very much.

(Applause) Chris Anderson: Thank you, Laura. I actually have a question.

First, the research is a mess.

I mean, who would design an experiment like that? (Laughter) I've seen it a few times, and I honestly still don't believe it really happens. But others are doing similar experiments. Check it out.

Babies really are geniuses.

LS: You know, in experiments they look very impressive, but think about what they look like in real life.

It starts when you are a baby.

After 18 months, your baby is talking to you. A baby's first words aren't just things like balls and ducks, they're things like "all gone" to mean disappearance and "ahh" to mean unintended action.

It has to be that powerful.

It must be much stronger than what I showed you.

They know the whole world.

A 4-year-old can speak almost anything.

(Applause.) CA: And, if I understand you correctly, another important point you're making is what we've been through over the years. How quirky and buggy our minds are, behavioral economics and the whole theory behind it is all about us not being rational agents.

You really are saying how extraordinary the big story is, and how there really are underrated geniuses out there.

LS: One of my favorite quotes in psychology comes from social psychologist Solomon Ashe. He said that the basic task of psychology is to remove the self-evidence veil from things.

There are an order of magnitude more decisions you make every day to make the world right.

You know about objects and their properties.

You'll know it when it's blocked. You know them in the dark

You can walk inside the room.

You can know what other people are thinking. you can talk to them.

Space can be navigated. you know about numbers

You know causality. You know about moral reasoning.

You're doing this so effortlessly that we don't see it, but that's how we make the world right, and it's an amazing and very difficult achievement to understand.

CA: I think some people in the audience have this view of the acceleration of technological power, but some may disagree with your statement that computers will never in our lifetime do what a three-year-old can do. But what is clear is that our machines have a lot to learn from toddlers in any scenario.

LS: I think so. There are some machine learning experts here.

So really, don't bet on babies or chimpanzees or technology, it's not just the quantity, it's the kind.

We have incredibly powerful computers, often with very large amounts of data, to do amazingly sophisticated things.

I think the human mind does something completely different. And it seems to me that the structured, hierarchical nature of human knowledge remains a major challenge.

CA: Laura Schultz, great food for thought. Thank you very much.

LS: Thank you. (applause)

You know, I've talked about some of these projects before. About the human genome and what it means, and the discovery of new gene sets.

We are actually starting from a new spot. We have digitized biology, and now we are moving from that digital code to a new stage in biology: the design and synthesis of life.

So we've always tried to ask the big questions.

"What is life?" I think this is something many biologists have tried to understand on many levels.

We tried different approaches and narrowed it down to the bare minimum of components.

We've been doing this digitally for nearly 20 years. When we sequenced the human genome, it was moving from the analog world of biology to the digital world of computers.

We are now asking, "Can we regenerate life from this digital universe, or create new life?"

This is a map of Mycoplasma genitalium, a tiny organism with the smallest genome of any species that can self-replicate in the laboratory. We have been trying to see if we can find even smaller genomes.

Of the approximately 500 genes present here, approximately 100 can be knocked out.

Looking at its metabolic map, it is relatively simple compared to ours. Believe me, this is simple. However, looking at all the genes that can be knocked out one at a time, it is highly unlikely that this will result in a viable cell.

So we decided the only way forward was to actually synthesize this chromosome and change the building blocks to allow us to ask some of these most basic questions.

So we started down the road of, "Can we synthesize chromosomes?"

Will chemistry allow us to make very large molecules like we've never done before?

If so, can the chromosome be activated?

By the way, chromosomes are just inert chemicals.

Therefore, the pace of digitization of our lives is increasing exponentially.

Our ability to write our genetic code is progressing rather slowly, but it is increasing and at our latest point it will be on an exponential curve.

We started doing this over 15 years ago.

In fact, several steps were required, starting with bioethical considerations before conducting the first experiments.

However, it turns out that the synthesis of DNA is very difficult.

There are tens of thousands of machines around the world that create tiny pieces of DNA that are 30-50 letters in length, and this is a degenerative process, so the longer you create the pieces, the more errors you make.

So I had to create a new way to put these little pieces together and fix all the errors.

And this is our first attempt, starting with digital information of the genome of Phi X174.

A small virus that kills bacteria.

We designed the piece, went through error correction, and ended up with a DNA molecule of about 5,000 letters.

The exciting phase was when we put this inert chemical inside bacteria and they started reading this genetic code and making virus particles.

The virus particles were then released from the cells and returned to kill the E. coli.

I was talking to the oil industry recently and they said they have a clear understanding of the model.

(laughs) They laughed more than you did. (Laughter) So I think this is a situation where software can actually build its own hardware inside a biological system.

But we wanted to do something bigger. I wanted to build the entire bacterial chromosome. This is a genetic code of over 580,000 characters. The idea was to build the chromosome into a cassette the same size as the virus so that we could actually change the cassette to understand what the actual components of a living cell are.

Design is very important, and if you start with digital information in your computer, that digital information has to be very accurate.

When this genome was first sequenced in 1995, the standard of accuracy was 1 error per 10,000 base pairs.

I actually reran the sequence and found 30 errors. If I had used that original sequence, it would never have booted.

Part of the design is to design a 50-character long piece that overlaps with every other 50-character piece to build smaller subunits that must be designed to work together.

Design a unique element for this.

You may have read that I put a watermark.

please think about it. We have a four-letter genetic code: A, C, G, T.

These letter triplets code for approximately 20 amino acids, with one letter designated for each amino acid.

Therefore, we can use our genetic code to write out words, sentences and thoughts.

At first, all I had to do was sign.

Some were disappointed by the lack of poetry.

We designed these pieces to be chewable with enzymes. There are enzymes that repair and combine them.

Then I started with 5,000-7,000 character pieces, combined them into 24,000 character pieces, and then started making sets of pieces up to 72,000 characters.

I'm trying to create a very robust process that can be understood in a minute, so at each stage I generated a lot of these pieces so I could sequence them.

We are reaching the automation stage.

So this is like a basketball playoff.

Once these very large pieces of over 100,000 base pairs are reached, they can no longer easily grow in E. coli. This exhausts all modern tools in molecular biology. So we turned to other mechanics.

We knew there was a mechanism called homologous recombination that biology uses to repair the DNA that joins the pieces together.

Here is an example of that. There is a creature called Deinococcus radiodurans that can receive 3 million rads of radiation.

As you can see in the top panel, that chromosome is just blown away.

After 12-24 hours it was back to normal.

We have thousands of creatures that can do this.

These microbes can dry out completely. They can live in a vacuum.

I believe that life can exist in outer space, migrate, and find new water environments.

In fact, NASA has shown that many such phenomena exist.

Here is an actual micrograph of a molecule built using these processes. It's really just using yeast mechanisms and the proper design of the parts that place them. Yeast assembles them automatically.

This is not an electron micrograph. This is just a normal micrograph.

It is such a large molecule that it can be seen with a light microscope.

These are about 6 seconds of photos.

So this is a publication we published some time ago.

This is a genetic code of over 580,000 characters. It is the largest molecule with a well-defined structure ever made by humans.

The molecular weight is over 300 million.

If printed with 10 fonts and no spaces, it would take 142 pages just to print this genetic code.

So how do we start chromosomes? How do we enable it?

Obviously, with viruses it's very easy. Dealing with bacteria is much more complicated.

For eukaryotes like us, it's even easier. Just take out a nucleus and put in another nucleus. That's what you've all heard about cloning.

In bacteria and archaea, chromosomes are integrated into cells, and we recently showed that chromosomes can be fully transplanted and activated from one cell to another.

We purified a chromosome from one microbial species -- roughly speaking, the two are as far apart as humans and mice -- added some genes to make this chromosome selectable, and enzymatically digested it to kill all the proteins. Putting this in a cell was quite spectacular. And I hope you can appreciate our very sophisticated graphics here.

A new chromosome entered the cell.

In fact, we thought this might be the limit, but tried to design the process a bit more.

This is the main mechanism of evolution.

We find all sorts of species that take a second or third chromosome from somewhere and add thousands of new traits to the species in an instant.

So those who think of evolution as just one gene changing at a time miss much of biology.

There are enzymes called restriction enzymes that actually digest DNA.

Chromosomes that were inside cells do not have chromosomes. The chromosomes we put in will.

When it is expressed, it recognizes the other chromosome as a foreign substance and chews it up, eventually leaving only cells with the new chromosome.

It turned blue because of the genes we put in.

Then, in a very short period of time, they lost all the characteristics of one species and transformed into a completely new species based on new software embedded inside their cells.

All the proteins have changed and so have the membranes. If you read the genetic code, it's exactly what we implanted.

So, while this may sound like genomic alchemy, running DNA software can change things very dramatically.

Well, I argued that this is not the origin. It is built on 3.5 billion years of evolution.

And we've been arguing that perhaps we're trying to create a new version of the Cambrian explosion where massive new speciation occurs based on this digital design.

Why do we do this?

I think this is pretty obvious for some needs.

Over the next 40 years, the population will grow from 6.5 billion to 9 billion.

For myself, I was born in 1946.

For every one of us who existed in 1946, there are now three humans on Earth. In 40 years there will be four.

We struggle to feed 6.5 billion people and provide fresh, clean water, medicine and fuel.

It's hard to do that with 9 people.

We use over 5 billion tons of coal and over 30 billion barrels of oil, or over 100 million barrels a day.

It will be a big challenge when trying to think of biological processes and alternative processes.

Of course, all the CO2 emitted from this material is released into the atmosphere.

We now have a database containing approximately 20 million genes from discoveries worldwide. I would like to consider these as future design elements.

There were only a dozen or so components in the electronics industry, but notice the diversity that has come out of it.

Here we are primarily limited by biological reality and our imagination.

Thanks to these rapid synthetic methods, we now have the technology to do what we call combinatorial genomics.

We now have the ability to build large robots that can produce a million chromosomes per day.

When we think about optimizing the process of manipulating those 20 million different genes, producing octane, making medicines and new vaccines, we can do more molecular biology with just a small team than all of science in the last 20 years.

And it's just a standard choice. You can choose according to survivability, chemical or fuel production, vaccine production, etc.

Here's a screenshot of some real design software we're working on to allow you to actually sit on your computer and design your species.

As you know, we don't necessarily know what it will look like. We know exactly what their genetic code looks like.

We are currently focused on 4th generation fuels.

As we've seen recently, turning corn into ethanol is just a bad experiment.

Second and third generation sugar-based fuels are coming relatively soon, along with much more valuable fuels like octane and various types of butanol.

But the only way we think biology can make a big impact without further increasing food prices or limiting its availability is to start with CO2 as a feedstock. So we are working on designing cells to go this route.

And we believe the first 4th generation fuels will be available in about 18 months.

Sunlight and carbon dioxide is one way...

(Applause.) But there are all sorts of other ways of what we've discovered around the world.

This is the creature we described in 1996.

It lives in the deep sea, where the water is nearly boiling, about a mile and a half deep.

Converts CO2 to methane using molecular hydrogen as an energy source.

We are looking at whether we can easily transport the captured CO2 by pipe to the site and convert that CO2 into fuel to power this process.

By doing so, I believe that we will be able to increase the number of fundamental questions in a short period of time, such as "What is life?"

We really have a modest goal of replacing the entire petrochemical industry -- (Laughter) (Applause) Right. If you can't do it at TED, where can you? -- (Laughter) It's a great source of energy...

We are also currently working to develop a set of immediate vaccines using these same tools.

Influenza epidemic this year. Always a year behind and a dollar short when it comes to a good vaccine.

I think we can change that by building a combination vaccine ahead of time.

Here, we take a look at what the future starts to look like as the evolutionary tree shifts and evolution is accelerated by synthetic bacteria, archaea, and finally eukaryotes.

We are far from improving people. Our goal is probably just to ensure that we have a chance to survive as long as we can. thank you very much.

(applause)

Remember when hormones made you feel sick?

Your skin was rough, your body was growing very quickly in strange places, and at the same time people expected you to grow up in this new way.

Teenagers, right?

Well, this same change happens in female babies.

And we know it's normal for teenagers to have mixed emotions, so why not talk about pregnancy in the same way?

Textbooks talk about the developmental stages of puberty, but they don't even have words to describe the transition to motherhood.

Is required.

I am a pregnant and postnatal female psychiatrist, reproductive psychiatrist, and in my ten years working in this field, I have noticed a pattern.

It's like this: A woman called me. She just had a baby and is worried.

she says: "I'm not good at this. It's not fun."

Do I have postpartum depression? ”

So I took a closer look at the symptoms of the diagnosis and it was clear that she was not clinically depressed, so I told her about it.

However, she is not at ease.

"You shouldn't feel this way," she insists.

So I said, "Okay, what did you expect it to be like?"

She says, "I thought being a mother would make me feel complete and happy.

I thought my instincts would naturally tell me what to do.

I wanted to think about the baby first. ”

This is an unrealistic expectation of what the transition to motherhood is like.

And it wasn't just her.

I had been getting calls from hundreds of women asking questions like this, and they were all worried there was something wrong because they couldn't measure.

And I didn't know how to help them. Because telling them they weren't sick didn't make them feel better.

I wanted to find a way to normalize this transition and explain how discomfort does not necessarily equate to illness.

So I decided to learn more about the psychology of motherhood.

But since doctors write mostly about diseases, they didn't really make it into medical textbooks.

So I turned to anthropology.

It took me two years, but in an out-of-print essay by Dana Rafael in 1973, I finally found a way to help frame this conversation: matrescence.

It's no coincidence that "matrence" sounds like "puberty".

Both are periods when body transformations and hormonal changes bring about upheavals in how a person perceives emotions and adapts to the world.

And like puberty, matrescence isn't a disease, but because it's not in the medical term and doctors aren't educating people about it, it's been confused with a more serious condition called postpartum depression.

Drawing from the anthropological literature, I have used a concept called "push and pull" to talk to patients about matrescence.

Here is the pull part.

As humans, our babies have unique addictions.

Unlike other animals, our babies cannot walk, cannot feed themselves and are very difficult to care for.

So evolution gave us this hormone called oxytocin.

It is also secreted before and after childbirth and during skin-to-skin contact, so it rises even without giving birth to a baby.

Oxytocin causes the human mother's brain to zoom in, attracting the mother's attention and making the baby the center of the mother's world.

But at the same time, her mind is trying to keep away. Because I remember that my identity has all the other parts. Not to mention other relationships, work, hobbies, spiritual and intellectual life, and physical desires to sleep, eat, exercise, have sex, go to the bathroom, and preferably be alone (laughs).

This is the emotional tug of war of matrescence.

This is the tension that the women who called me were feeling.

That's why they thought they were sick.

If women understood the natural progression of matrescence and knew that most people find it difficult to live with this push and pull, that ambivalence is normal and not shameful under these circumstances, I think they would feel less alone, feel less blamed, and even postpartum depression rates would decrease.

I would love to study it someday.

I'm a believer in talk therapy, so women need to talk to each other, not just me, if we're going to change our culture about transitioning to motherhood.

So, mothers, discuss your adulthood with other mothers, friends, and partners if you have one. This will help them understand their transition and be better able to support you.

But it does more than just protect your relationship.

Preserving another part of your identity also leaves room for your child to develop their own identity.

When a baby is born, the mother also becomes unstable.

The matrescence is deep, but it is also hard, and that is what makes it human.

thank you.

(applause)

(music) (singing) It was a teenage wedding and the old people were praying for a successful wedding.

It turns out that Pierre really loved Mademoiselle.

Oh, now young Monsieur and Madame have rung the chapel bells.

C'est la vie, say the old people, it will show you things you can never tell.

No no.

They equipped the apartment with a two-room roebuck sale.

The cooler was packed with TV dinners and ginger ale.

Ah, but when Pierre found a job, the little money coming in worked.

C'est la vie, say the old people, it will show you things you can never tell.

I can never say

They bought an improved passenger car. It was a cherry red '53.

They drove it to New Orleans to celebrate their anniversary.

Oh, that's where Pierre got married to the beautiful Mademoiselle.

C'est la vie, say the old people, it will show you things you can never tell.

No, no, we will never know.

No, no, we will never know.

I can never say

I can never say

No, no, we will never know.

(Applause and cheers) Thank you.

I recently had the wonderful opportunity to search for gold in a vast mine of songs released by Chess Records. Chess Records is a Chicago-based label that was very active in the US during the 50's and 60's and their music spread all over the world.

And the songs I'm singing tonight are from my new album, Playing Chess, and pay tribute to those songs.

And they were exactly the innovators of rock 'n' roll, soul and R&B as we know them today.

(Applause) (music) (singing) Over mountains, over seas, a girl is waiting, she's waiting...

myself.

(music) Over rivers, over every cloud, she passed the raging winds.

A girl is waiting for me on the other side of the mountain.

(music) Tell the sand, the blade of grass, the wind, tell me my love.

A girl is waiting for me on the other side of the mountain.

Tell the moon in the sky

Tell all the birds that fly over the mountains...

my love is waiting for me

Oh, every starry dark night, oh, what a tightly sealed mystery.

A girl is waiting for me on the other side of the mountain.

Tell the moon in the sky

Tell the flying birds that my love awaits me over the mountains.

Every dark and starry night, oh, what a tightly sealed mystery.

A girl is waiting for me on the other side of the mountain.

she's waiting for me

Oh she's waiting for me

I got it, I got it, I got it, I got it

Oh, I got it, I got it, I got it, I got it

Oh, I know, I know, I know, I know, I know, oh, oh, oh

(applause and cheers)

It's been almost 20 years since 9/11.

It's time to take a look at where we stand and stop and think.

It's time to ask ourselves if the assumptions and policies we've made in the wake of these tragic events have really made us safer.

Have they made our societies more resilient in both Europe and America?

Having worked in the field of security and defense all my life, I am convinced that now, more than ever, we need to fundamentally rethink how we think and act about security, especially international security.

International security here really means what we do, how we prepare countries to better respond to and prevent external threats, and how we protect our citizens.

The key for both is to focus on protecting civilians, both at home and in the countries where we are stationed in the name of security.

Now, this line of thinking runs counter to the static narrative we've been crafting over the past two decades about what security is and how to get it, but that narrative is flawed and, worse, counterproductive.

Over the past two decades, both in America and Europe, we have come to accept that we must talk about security in a zero-sum perspective. As if the only way to be more secure is to compromise values ​​and rights, security versus human rights, security versus freedom and development.

This is a false objection.

That doesn't work.

We need to recognize that security and human rights are intrinsically linked rather than competing values.

After all, the most basic human right is the right to life and freedom from violence, and the state's most basic responsibility is to ensure that right for its people.

Conversely, when you think about communities around the world affected by war and conflict, it is insecurity and violence that prevents them from achieving full freedom and development.

Now they need basic security just like we do, they need it to live a normal life and enjoy their human rights.

That's why we need to shift.

We need to recognize that sustainable security is built on a foundation of human rights, on the promotion and respect of human rights.

And over the past two decades, we have accepted that the best way to secure our country is to defeat our enemies, and that we must rely almost exclusively on our military to do so.

Again, this clashes with what I see in my work, research, and the field.

What I see is that building sustainable security has less to do with crushing the enemy or winning battlefields, it's much more about protecting victims and building stability.

An army alone is simply not enough for that.

This is why I believe we need to shelve the never-ending war on terrorism and replace it with a security agenda based on the principle of protecting civilians, regardless of where they come from, what passport they have, or where they live: Vancouver, New York, Kabul, Mosul, Aleppo, Douma.

Sustainable security shows that efforts abroad that focus on protecting civilians and ensuring that their lives are lived with dignity from violence are more likely to ensure long-term security at home.

For example, we all know that defeating ISIS is a security achievement.

absolutely.

But rebuilding destroyed housing, restoring order and ensuring a representative political system is equally, if not more important, not only for the safety of civilians in Iraq and Syria, but also for our own security and global stability.

More fundamentally, the danger of ISIS should be considered not only in the number of weapons it possesses, but also in the number of children it keeps out of school or indoctrinated.

This is for security reasons.

From a security perspective, the long-term generational impact of millions of children in Syria growing up with nothing but war and no schooling is a far more dangerous threat to stability than all of ISIS' arsenals combined, and we need to spend as much time and energy to counter it as we would to counter ISIS militarily.

For the past two decades, our security policy has been short-term.

It's focused here and now.

It systematically downplays the link between what we do today in the name of security and the long-term implications of that choice.

In the years since 9/11, some of the choices and policies we have made have probably made us less safe, not more secure, in the long run.

Sustainable civilian-centred security needs to consider what happens in the long run.

Again, relying on drones to target enemies in distant countries, for example, could be a tool.

It could be a tool to ensure or mitigate the threat of imminent attack against the United States.

But what about the long-term effects?

When civilians are killed and communities are targeted, it sets off a vicious cycle of war, conflict, trauma and radicalization that is central to many of the security challenges we face today.

This does not guarantee our safety in the long run.

We need civilian security, we need sustainable civilian-centred security, and we need it now.

We need to encourage thought and research on this concept and do it.

We live in a dangerous world.

We face many threats to peace and conflict.

As in the immediate aftermath of 9/11, we cannot help but think about international security.

But we must learn the lessons of the last 20 years.

Getting security right requires a long-term focus.

We need to focus on protecting civilians.

And we need to respect and recognize the fact that sustainable security is built on a foundation of human rights.

Otherwise, in the name of security, we risk making the world a far more dangerous and unstable place than it has been.

thank you.

(applause)

I'm so excited to share with you some truly amazing findings about what makes a company most successful and what really matters most to a startup's success.

I believe startup organizations are one of the greatest forms of making the world a better place.

Bringing together a group of people with the right equity incentives and organizing them into a startup can unlock human potential in ways never before possible.

Let them achieve incredible things.

But if startup organizations are so great, why do so many fail?

that's what i wanted to know.

I wanted to know what really matters most to startup success.

And I wanted to approach it systematically and avoid my intuition and misconceptions from many companies I've seen over the years.

I wanted to know this because I've been in business since I was 12 selling candy at a bus stop in middle school, building solar energy devices in high school, and loudspeakers in college.

After graduating from college, I started a software company.

And 20 years ago, I started Idealab. Over the last 20 years, we've launched over 100 companies, with many successes and many big failures.

We have learned a lot from those failures.

So I tried to find out what are the biggest factors that make a company successful or unsuccessful.

So let's take a look at these five.

First, an idea.

I thought ideas were everything.

I named my company Idealab because of how much I adore the "Aha!" The moment I first came up with an idea.

But over time, I've come to realize that perhaps the idea is more important than the team, execution, and adaptability.

I never thought I'd be quoting boxer Mike Tyson on the TED stage, but he once said, "Everyone has a plan until they get punched in the face." (Laughter) I think that applies to business as well.

The most important part of a team's execution is its ability to adapt to being punched in the face by a customer.

Customers are the real reality.

That's why I came to think that the team might be the most important thing.

Then we started thinking about business models.

Does the company have a clear path to customer revenue generation?

It began to rise to the top of my thoughts on what was probably the most important thing for success.

Next, I looked into fundraising.

Sometimes companies received large sums of money.

Maybe that's the most important thing?

And, of course, timing.

Is this idea premature and the world not ready yet?

Is it too early in the sense that we must first enlighten the world?

is it just right?

Or is it too late and there are already too many competitors?

So I carefully examined these five factors at many companies.

And I looked at all 100 Idealab companies and 100 non-Idealab companies and tried to come up with something scientific about it.

First, among these Idealab companies, the top five (Citysearch, CarsDirect, GoTo, NetZero, Tickets.com) were all billion dollar successes.

And the bottom five (Z.com, Insider Pages, MyLife, Desktop Factory, Peoplelink), which everyone had high hopes for, did not succeed.

So I tried to rank how companies felt they scored on each dimension for all these attributes.

And for companies other than Idealab, we looked at big successes like Airbnb, Instagram, Uber, Youtube, and LinkedIn.

Other failures include Webvan, Kozmo, Pets.com Flooz, and Friendster.

The lowest tier companies had strong funding and sometimes even business models, but they were not successful.

I actually tried to find out what was the biggest factor in the success and failure of all these companies, and the results really surprised me.

Timing was the most important thing.

42% of the difference between success and failure was due to timing.

Team and execution came in second, and ideas, idea differentiability, and idea uniqueness actually came in third.

It's not absolutely definitive, not that the idea isn't important, but I was very surprised that it wasn't the most important one.

Sometimes it was more important to actually measure the time.

The last two, business model and fundraising, really made sense to me.

I think it makes sense to have the business model so low. Because you can start without a business model and add a business model later as your customers demand what you're creating.

And I think the same goes for funds. Even if you are short on funds at the beginning, especially in today's times, it is very easy to get strong funds when you are gaining momentum.

Now let's look at some concrete examples of each.

So let's make it big like the Airbnb we all know.

Well, that company famously got taken over by a bunch of smart investors because people thought, "Nobody's going to rent out space in their home to a stranger."

Of course, people proved it wrong.

But one of the reasons it's been successful, besides a great business model, a great idea, and a great execution, is timing.

That company emerged right in the middle of a recession when people really needed extra money, and perhaps helped people overcome their reluctance to rent out their homes to strangers.

Same with Uber.

Uber is here. We had a great company, an incredible business model, and great execution.

But the timing was so perfect for the need to get the drivers into the system.

Drivers were looking for extra money. It was very, very important.

Part of our early success, Citysearch came at a time when people needed a web page.

GoTo.com, which we actually announced at TED in 1998, was around a time when businesses were looking for a cost-effective way to get traffic.

We thought the idea was pretty cool, but in reality timing was probably more important.

And there are also some of our failures.

We founded an online entertainment company called Z.com.

we were so excited about it. We've raised enough money, we have a great business model, and we've been able to sign some incredible Hollywood talent to join the company.

However, broadband penetration was too low in 1999-2000.

The company eventually went out of business in 2003 because it was so difficult to watch video content online that you had to put codecs in your browser to do all this work.

Just two years later, when Adobe Flash solved the codec problem and broadband penetration in the US surpassed 50%, YouTube came at a perfect time.

Great idea, but incredible timing.

In fact, YouTube didn't even have a business model when it started.

I wasn't even sure if it would work.

But it was beautiful, beautiful timing.

In summary, execution is definitely very important.

Ideas are very important.

But timing may be even more important.

And the best way to really assess timing is to actually see if consumers are really ready to accept what you offer.

And to be really, really honest, don't deny the results you see. Because if you love something, you want to push it forward. But we have to be very honest about that timing factor.

As I said earlier, I believe startups can change the world and make it a better place.

I hope that some of these insights will help you increase your success rate a little bit, and great things will happen to the world that wouldn't have happened without it.

Thank you very much for coming to so many audiences.

(applause)

(Music) (Music) (Applause) (Applause)

In the great 1980s movie The Blues Brothers, John Belushi goes to meet Dan Aykroyd at his Chicago apartment for the first time.

It's a small, tiny space, only three feet from the tracks.

As John sits on Dan's bed, a train rattles through the room.

John asks, "How often does that train pass?"

Dan replies, "Too often, you won't notice it."

And then something falls from the wall.

We all know what he's talking about.

As humans, we get used to the routine very quickly.

As a product designer, it's my job to see, feel and try to improve those everyday things.

For example, can you see this fruit?

See this little sticker?

I didn't have that sticker when I was a kid.

But as the years went by, someone came up with the brilliant idea of ​​putting that sticker on fruit.

why?

Well, it will be faster to get in and out of the store.

But now we have a new problem.

You come home hungry and when this ripe, juicy fruit is on your counter, you just want to pick it up and eat it.

Except now you have to look for this little sticker.

Then dig it with your fingernails and damage the flesh.

Then roll up the sticker. You know what I mean.

and try to flick it off your finger.

(Applause) It's not fun at all.

But something interesting happened.

You probably felt that feeling the first time you did it.

You just wanted to eat fruit.

you were upset

By the tenth time, I became less upset and started peeling the labels off.

By the 100th time, at least I was numb.

I simply picked up a piece of fruit, dug it with my fingernail, and tried to flick it off, but wondered, "Was there another sticker?"

Why?

Why do we get used to the routine?

As humans, our brain power is limited.

So our brains encode what we do every day into habits so that we have space to learn new things.

This is a process called habituation, and it's one of the most basic ways humans learn.

Now, habituation is not necessarily a bad thing.

Do you remember learning to drive?

I certainly think so.

My hands on the steering wheel were clenched at 10 o'clock and 2 o'clock, and I was looking at everything there: cars, traffic lights, pedestrians.

It's a nerve-wracking experience.

It was so bad that I couldn't even talk to other people in the car or even listen to music.

But then something interesting happened.

As the weeks went by, driving became easier and easier.

you made it a habit.

It became fun and started to become second nature.

And you can talk to your friends and listen to music again.

So, there's a good reason why our brains make things habitual.

Otherwise we will always notice every detail.

It's exhausting and leaves you with no time to learn new things.

However, there are times when we are not used to it.

If it makes us unaware of the problems around us, that's bad.

And if that prevents us from noticing and fixing those problems, that's really bad.

Comedians know this all too well.

Jerry Seinfeld's entire career was built on noticing the little details, the stupid things we do every day that we don't remember.

He told me about a time when he was visiting a friend, but he just wanted a nice shower.

He reached out and grabbed the handle and turned it slightly one way, but it was 100 degrees too hot.

And he reversed it and it was 100 degrees too cold.

He just wanted a comfortable shower.

Well, we've all been there, but we just don't remember it.

But Jerry did, and that's the comedian's job.

But as designers, innovators, and entrepreneurs, our job is to not only notice those problems, but go a step further and try to fix them.

Look, this person is Mary Anderson.

In 1902 she was visiting New York City.

It was a cold, rainy and snowy day, but she was warm in the tram.

On her way to her destination, she notices that the driver is opening the window to remove excess snow so that she can drive safely.

But when the windows were opened, cold, damp air entered the cabin, to the dismay of all passengers.

Perhaps most of the passengers thought, "This is true, I should open the windows and clean them."

That's exactly what it is. ”

But Mary didn't.

Mary wondered, "What if divers could actually clean their windshields from the inside, drive safely, and their passengers could actually stay warm?"

So she grabbed a sketchbook and started drawing what would become the world's first windshield wiper.

Now, as a product designer, I strive to see the world from people like Mary as it is, not the way we think it is.

why?

But it's hard to solve a problem that almost no one sees.

Some now wonder if we are born with this ability, or not, as if Mary Anderson was hardwired from birth to be able to see the world more clearly.

That was not the case with me.

I had to work on it.

During his years at Apple, Steve Jobs asked us to come in every day and see our products through the eyes of our customers—new customers—customers who were afraid, frustrated, and excited with anticipation that new technology products might soon help.

He called it a novice and wanted to focus on those little details to make it faster, easier, and seamless for new customers.

So I clearly remember the early days of the iPod.

Back in the '90s, being a gadget freak like me, I rushed to the store for the latest gadget.

I took my time going to the store, checked out, got home and started unboxing.

And there was another little sticker. It says "Please charge before use".

what!

can't believe it!

I spent a lot of time buying this product, but I need to charge it before using it.

You have to wait until what feels like an eternity to use that coveted new toy.

It was crazy.

But do you know?

If batteries were included, they had to be charged before use.

Steve noticed that and said, "Our product doesn't allow that."

So what did we do?

Normally, if you have a product with a built-in hard drive, the factory will run it for about 30 minutes after the customer takes it out of the box to see if the hard drive will still work a few years later.

what would we have done instead?

We ran the product for over two hours.

why?

First of all, you can create a higher quality product, it's easier to test, and you can be sure it's good for your customers.

But most importantly, the battery is fully charged and ready to use right out of the box.

So your customers are excited to start using your product.

It was great and worked.

Almost every battery-powered product today comes fully charged out of the box, even if it doesn't have a hard drive.

But at the time we noticed that detail and fixed it, and now others do as well.

No more "charge before use".

So why am I telling you this?

Well, capturing the invisible as well as the obvious is important in everything we do, not just in product design.

There are invisible problems around us that we can solve.

But first you have to see and feel them.

So I hesitate to give hints about neuroscience or psychology.

There are too many experienced people in the TED community who know more about it than I do.

But I'd like to leave you with a few tips I'm doing, and we all can do, to combat habituation.

My first tip is to look at the bigger picture.

When working on a problem, it can take many steps to get to that problem.

And in some cases, many steps are required after that.

If you can step back and look at the bigger picture, you might be able to change some of those boxes before they become a problem.

Maybe you can combine them.

Maybe we can remove them entirely to improve it.

Let's take the thermostat as an example.

When it first appeared in the 1900s, it was very easy to use.

You can also raise or lower it.

people understood them.

But in the 1970s, the energy crisis hit and customers started thinking about ways to save energy.

what happened?

Thermostat designers decided to add a new step.

It had to be programmed, not just raised and lowered.

So you can tell the desired temperature at a specific time.

It seemed great.

Every thermostat was starting to add that feature.

But it turns out that no one is saving energy.

Now why?

Well, one cannot predict the future.

They didn't know how their week would change from season to season and from year to year.

So no one was saving energy, so what happened?

Thermostat designers went back to the drawing board and focused on the programming step.

They made a better UI and better documentation.

But even after all these years, people weren't saving energy because they couldn't predict the future.

So what did we do?

Instead of programs that simply monitor when you turn the temperature up or down, when you like a certain temperature when you wake up, or when you go out, we've put machine learning algorithms in place.

And what do you know?

done.

People are saving energy without programming.

So it doesn't matter what you do.

If you step back and look at all the boxes, there may be a way to remove one or combine the boxes to make the process easier.

That's my first tip. Take a broader view.

My second tip is to look closely.

One of my great teachers was my grandfather.

He taught me all about the world.

He taught me how things are built, how they are repaired, and the tools and techniques I needed to successfully complete a project.

I remember a story he told me about Neji. The story is that the right job needs the right screw.

There are many types of screws such as wood screws, metal screws, anchors, and concrete screws.

Our job is to create a product that can be easily installed on every custom by ourselves without a professional.

So what did we do?

I remembered a story my grandfather told me, and I thought, "How many types of screws can I put in a box?"

Will it be 2, 3, 4, 5?

Because there are many types of walls. ”

So we thought about it, optimized it, and came up with three different screws to put in the box.

We thought it would solve the problem.

But in reality it was not.

So we shipped the product and people weren't having a great experience.

So what did we do?

We quickly went back to square one after realizing it wasn't right.

And we designed a special screw that disappointed our investors very much - a custom screw.

They said, "Why are you spending so much time on tiny screws?"

Go out and sell more! ”

And we said, 'If we do this right, we'll sell more.'

And in the end we did.

Custom small screws made it easy to mount and place on the wall with just one screw in the box.

So we focus on the little details that we may not see and observe them saying, "Is that important or is that how we've always done it?"

Maybe there is a way to remove them. ”

So my final piece of advice is to think younger.

Every day I am faced with interesting questions from my three young children.

They come up with questions like "Why can't cars fly around traffic jams?"

Or "Why don't the laces have Velcro?"

In some cases, these questions are wise.

My son came to me the other day and said, "Go to the mailbox and check."

He looked at me puzzled and said, "Why can't the mailbox automatically check and let me know there's mail in there?" (Laughter) I thought, "That's a very good question."

So they can ask a lot of questions, and sometimes it turns out that we don't have the right answers.

We say, "Son, that's how the world works."

Therefore, the more we touch something, the more we become accustomed to it.

But kids won't be long enough to get used to those things.

So when we come across a problem, we try to fix it right away, and sometimes we find a better way, and that way is really better.

So my advice that we want to keep in mind is to have young people, or young minds, on your team.

Because if you have such a young mind, everyone in the room will think younger.

Picasso once said, "All children are artists.

The question is how he or she will continue to be an artist after he or she grows up. ”

We all perceived the world more clearly the first time we saw it, before lifelong habits got in the way.

Our challenge is to get back there, feel that frustration, look at the details, look wider, look closer, and think young so we can remain beginners.

It is not easy.

It requires resisting one of the most basic ways we make sense of the world.

But if you do, you might be able to do some pretty amazing things.

For me, I hope it makes for better product design.

To you it could mean something different, something powerful.

Our challenge is to wake up every morning and ask, "How can I experience the world better?"

Then maybe, maybe we can get rid of this stupid little sticker.

thank you very much.

(applause)

About ten years ago, I went through a bit of a tough time.

So I decided to go see a therapist.

I had seen her for a few months, and one day she looked at me and said, "Who raised you to three years old?"

It seemed like a strange question. I said, "My parents."

And she said, "I don't really think so, because if that were the case, we would be dealing with a much more complex issue than this one."

It sounded like a joke setup, but I knew she was serious.

Because when I first started seeing her, I was trying to be the funniest person in the room.

And I tried to untangle these jokes and she noticed me right away and every time I tried to tell a joke she looked at me and said, "That's really sad."

(Laughter) It's terrible.

So I thought I had to be serious about it, so I asked my parents who actually raised me until I was 3 years old.

And to my surprise, I was told that my primary caregiver was a distant relative of that family.

I used to call her Auntie.

I remember my aunt so clearly that she felt like she had been a part of my life since I was much older.

I remember thick, straight hair, and it wrapped around me like a curtain as she bent down to pick me up. Her soft Southern Thai accent. Just like I hold on to her even if she just wants to go to the bathroom or something to eat.

I loved her, but the ferocity that children sometimes have before I understood that love also requires letting go.

But my most vivid and vivid memory with my aunt is also one of the first in my life.

I remember her being beaten and slapped by another member of my family.

I remember screaming hysterically over little things like wanting to hang out with her friends or being a little late and wanting her to stop. I did so each time.

I got so hysterical about her treatment that I ended up just getting beaten up behind closed doors.

Things got so bad for her that she eventually ran away.

As an adult, I learned that she was only 19 years old and had been brought to the United States from Thailand on a tourist visa to care for me.

She worked in Illinois for a while, but eventually returned to Thailand, where she reunited with her at a political rally in Bangkok.

I held on to her again like I did when I was a kid, let go, and then promised to call her.

But I never was.

Because if I said everything she meant to me, I was afraid that I probably owe the best part of myself to her care, and that the word "sorry" was like a thimble to soften all the guilt, shame, and anger I was feeling for all that she had endured. I thought that if I said those words to her, I would never stop crying again.

Because she saved me.

And I didn't save her.

I am a journalist and have written and researched human trafficking for the past eight years or so, but until recently I had never connected this personal story to my professional life.

I think this deep disconnect actually epitomizes much of our understanding of human trafficking.

Because human trafficking is far more prevalent, complex, and familiar than most of us realize.

I spent time in prisons and brothels and interviewed hundreds of survivors, law enforcement and NGO workers.

And given what we have done against human trafficking, I am very disappointed.

For one thing, it's because we haven't discussed the issue quite properly.

When I say "trafficking," most people don't think of someone like my aunt.

Perhaps you think of young girls and women who were brutally forced into prostitution by violent pimps.

It's real suffering, it's a real story.

But this story pisses me off for more than just the reality of the situation.

As journalists, I care so much about how we relate to each other through language and how we tell that story, with all the gory, violent details and salacious aspects included - I call it 'see her scars' journalism.

We use the story to convince ourselves that human trafficking is about bad guys doing bad things to innocent girls.

The story gets us out of trouble.

It removes all the social backgrounds against which we can be charged: structural inequality, poverty, barriers to immigration.

We assume that human trafficking is just forced prostitution, but in reality it is part of our daily lives.

Tell me what you mean

Forced prostitution accounts for 22 percent of trafficking.

10% are in forced labor by the state.

But a whopping 68 percent of it is aimed at producing goods and providing services that most of us rely on every day, in areas such as farming, domestic labor and construction.

It is food, care and housing.

And somehow these most important workers are also the most underpaid and exploited people in the world today.

Human trafficking is the use of force, fraud, or coercion to force others to work.

It has also been found in cotton fields, coltan mines, and car washes in Norway and England.

Found on US military bases in Iraq and Afghanistan.

Found in Thai fisheries.

The country has become the world's largest shrimp exporter.

But what is behind the fact that you can get so many shrimp at such a low price?

Thai military arrested for selling Burmese and Cambodian migrants to fishing boats.

Those fishing boats were dismantled, the men forced to work, and thrown off the boats if they made the mistake of falling ill or resisting treatment.

Those fish were then used as shrimp feed, and the shrimp were sold to four major global retailers: Costco, Tesco, Walmart and Carrefour.

Human trafficking takes place on a smaller scale and in places you can't even imagine.

Traffickers force young people to drive ice cream trucks or sing in traveling boys' choirs.

Human trafficking was also discovered at a hair braiding salon in New Jersey.

The planning for this incident was incredible.

The traffickers found a young family from Ghana and Togo and told them that their daughters would get an excellent education in the United States.

They then tracked down the Green Card Lottery winners and said, 'We can help you.

I will arrange the air ticket for you. We will cover the cost.

All you have to do is take this young girl and tell her she is your sister or your spouse.

Once they all arrived in New Jersey, the girls were taken away and forced to work 14 hours a day, 7 days a week for five years.

They brought the traffickers nearly $4 million in profit.

This is a big problem.

So what have we done about it?

We have focused primarily on the criminal justice system.

But keep in mind that most trafficking victims are poor and marginalized.

They are immigrants and people of color.

Sometimes engaged in the sex industry.

And for these people, the criminal justice system is too often part of the problem, not the solution.

Study after study, in countries ranging from Bangladesh to the United States, between 20 and 60 percent of sex workers surveyed said they had been raped or assaulted by police in the past year alone.

Those engaged in prostitution regularly receive multiple convictions for prostitution, including those who have been trafficked.

That criminal record makes it very difficult to get out of poverty, out of abuse, out of prostitution, even if you want to.

Non-sex workers risk deportation if they try to resist their treatment.

In case after case that I have researched, employers blithely ask the police to intimidate or deport striking workers.

If these workers escape, they risk becoming part of a large undocumented workforce that is subject to the whims of law enforcement even if they are caught.

Law enforcement agencies are expected to identify victims and prosecute traffickers.

However, they have helped and identified fewer than 50,000 of the estimated 21 million trafficking victims worldwide.

This is like comparing the population of the world to the population of Los Angeles, proportionally speaking.

In terms of convictions, fewer than 500 of the estimated 5,700 convictions in 2013 were for labor trafficking.

Note that labor trafficking accounts for 68 percent of all trafficking, but less than 10 percent of convictions.

I've heard one expert say that human trafficking happens where needs and desires meet.

I would like to add one more element.

Human trafficking occurs in sectors where workers are excluded from protection and denied the right to organize.

Human trafficking does not occur in isolation.

It happens in an organizationally poor work environment.

You might think, oh, she's talking about a failed state or a war-torn state, or I'm really talking about the United States.

Please tell me what it's like.

I spent months investigating a human trafficking case called Global Horizons involving hundreds of Thai farm workers.

They were sent across the United States, working pineapple plantations in Hawaii and apple orchards in Washington, wherever work was needed.

They were promised three years of solid farm work.

So they took calculated risks.

They sold their land, sold their wives' jewelry, and made thousands of dollars in recruitment fees for this company, Global Horizons.

However, when he was taken away, his passport was confiscated.

Some of the men were beaten or held at gunpoint.

They worked hard in the fields.

This incident shocked me a lot.

After returning home, when I was wandering around the supermarket, I got stuck in the fruit and vegetable department.

I remembered the sumptuous meals that the Global Horizons survivors cooked for me every time they came for an interview.

They finished their meal with a plate of perfect long-stemmed strawberries, handed them to me and said: "Isn't this the kind of strawberry you eat with someone special in America?"

Besides, don't you think it tastes better if you know the person who chose it? ”

A few weeks later, when I stood in the grocery store, I realized that I had no idea who to thank for this many items, and I had no idea how they were treated.

So, like a journalist, I started looking more closely at the agricultural sector.

And it turns out that there are too many fields, but too few labor inspectors.

We found layers of plausible deniability among growers, distributors, and processors, but God knows who else.

The survivors of Global Horizons were brought to America through a temporary guest worker program.

The guest worker program ties an individual's legal status to their employer and denies the worker the right to associate.

Mind you, what I'm describing about this agricultural sector or guest worker program isn't really human trafficking.

It's just what we've determined is legally permissible.

And this, I would argue, is fertile ground for exploitation.

And all this was hidden from me before I even tried to understand it.

I wasn't the only one grappling with these issues.

Pierre Omidyard, founder of eBay, is one of the world's largest anti-trafficking philanthropists.

And even he accidentally invested nearly $10 million in a pineapple plantation where the Global Horizons case described the worst working conditions.

When he found out, he and his wife were shocked, horrified, and eventually wrote an op-ed in the newspaper stating that it was the responsibility of all of us to learn as much as we could about the labor and supply chains of the products we support.

We all have the same opinion.

What if each of us decided that we would no longer support companies if they would not eliminate exploitation from their workforces and supply chains?

What if we demand a law that asks for the same?

What if every CEO in the world decided to give up on their business and say, "I'm done"?

What if we abolish migrant worker recruitment fees?

What if we decided that guest workers had the right to unite without fear of retribution?

These will be decisions that will be heard around the world.

This is not a question of buying fair trade peaches and being done with it, and spending your own money to buy a guilt-free zone.

Not exactly.

This is a decision to change a broken system that we have been unknowingly but willingly profiting from for too long.

We often think about the victimization of human trafficking survivors.

But that's not my experience with them.

Over the years I have spoken with them, they have taught us to be beyond our worst days.

Each of us is more than we have ever lived.

Especially survivors of human trafficking.

These people were the most resourceful, resilient, and responsible people in the community.

They were the kind of people who would take a gamble.

You say you sell the ring because it has the chance to send you to a better future.

They were messengers of hope.

These survivors don't need to be saved.

They need solidarity because they are behind today's most inspiring social justice movements.

The nannies and domestic workers who marched with their families and those of their employers, their work led to the signing of an international treaty on the rights of domestic workers.

A group of sex-trafficked Nepalese women decided to unite to form the world's first anti-trafficking organization headed and run by the victims themselves.

These Indian shipyard workers were trafficked for recovery after Hurricane Katrina.

Despite the threat of deportation, they stepped out of their jobs and marched from New Orleans to Washington, D.C. to protest labor exploitation.

They co-founded an organization called the National Guest Workers Alliance, through which they would help expose exploitation and abuse by other workers in the supply chains of Walmart and Hershey factories.

And although the Justice Department has refused to accept the lawsuit, a team of civil rights lawyers won the first of a dozen civil lawsuits in February, netting their clients $14 million.

These survivors are fighting for people and other workers they don't know yet, and for the possibility of a just world for all of us.

This is our chance to do the same.

This is our chance to make decisions that show who we are as people and as a society. That our prosperity is no longer prosperity as long as it is anchored in other people's pain. that our lives are intimately intertwined. And that we have the power to make other choices.

I was very hesitant to tell you the story of my aunt.

Before I started this TED process and took this stage, I literally spoke to several people about this. Because, like many journalists, I'm far more interested in knowing your story than sharing much about mine.

I have not done any journalistic due diligence on this either.

I haven't submitted a ton of requests for documents, and I haven't interviewed everyone and their mothers, but my aunt still hasn't been found.

I don't know what happened to her or what her life is like now.

The story I told you is messed up and unfinished.

But I think this reflects the awkward and unfinished situation we are all in when it comes to human trafficking.

We are all caught up in this issue.

But it also means we are all part of the solution.

Finding ways to build a fairer world is our job, the story we tell.

So let's tell it the way we should have from the beginning.

Let's tell this story together.

Thank you very much.

(applause)

Confession: I am an archaeologist and museum curator, but I am paradoxical.

In my museum, I collect things, but I put things back where they came from.

I love museums because they are social and educational, but what draws me most to museums is the magic of objects. Million-year-old hatchets, totem poles, and Impressionist paintings all take us beyond our imagination.

In museums, we stop to ponder, to gaze in meditation and wonder at our human empire of things.

Now you know why museums in the US alone draw more than 850 million visitors each year.

In recent years, however, museums have turned into battlefields.

Communities around the world don't want to see their culture in far-flung facilities they can't control.

They want their cultural property to be repatriated and returned to their place of origin.

Greece is seeking the return of the British Museum's collection of classical sculpture, the Marbles of the Parthenon.

Egypt demands antiquities from Germany.

New Zealand's Maori want to see the tattooed heads of their ancestors returned from museums around the world.

But these claims pale in comparison to those of Native Americans.

U.S. museums have already returned more than one million artifacts and more than 50,000 Native American bone sets.

To explain what's at stake, let's start with the God of War.

Wood carvings made by the Zuni people of New Mexico.

In the 1880s, anthropologists began collecting them as evidence of American Indian religion.

They came to be seen as beautiful, and were the forerunners of the wild sculptures of Picasso and Paul Klee, and of the modern art movement.

From one point of view, the museum did exactly what it was supposed to do with the God of War.

It helped introduce the world to a lesser known art form.

But another way of looking at it is that the museum has committed a terrible crime of cultural violence.

To the Zuni, the War God is not a work of art, not even an object.

it is existence.

Each year, among the Zuni, priests ritually carve a new war god, Ahayuda, and bring it to life in a lengthy ritual.

They are placed in the sacred shrines where they live to protect the Zuni tribe and keep the universe in balance.

No one can own or sell a War God.

They belong only to Earth.

So the Zuni want them back from the museum so they can go to their shrine home to fulfill their spiritual purpose.

What do curators do?

I believe the god of war should be returned.

This may be a surprising answer.

After all, my conclusion contradicts the words of the world's most famous archaeologist, "It belongs in a museum!"

(Laughter.) Indiana Jones said it not just to drive the plot of the movie, but to make people aware of the undoubted benefits that museums bring to society.

I couldn't come up with my own idea.

I grew up in Tucson, Arizona and fell in love with the Sonoran Desert past.

Beneath the city's drab shopping malls, I was amazed that 12,000 years of history were waiting to be discovered.

When I was 16, I took an archeology class and started excavating.

My high school teacher helped me set up my own lab to study animal bones.

But when I entered college, I learned that my future career had a dark history.

Beginning in the 1860s, Native American bones became a scientific tool, with thousands of bones collected to prove new theories of social and racial hierarchies.

Native American human remains were looted from graves, and some were even brought fresh from the battlefield.

When archaeologists discovered white graves, their skeletons were often quickly reburied, while the Aboriginal bones were placed on museum shelves as specimens.

In the wake of war, stolen land, boarding schools, and laws banning religion, anthropologists have collected sacred items believing indigenous peoples to be endangered.

You could call it racism or colonialism, but that label is less important than the fact that Native Americans' rights and culture have been robbed of them over the last century.

After years of protests by Native Americans, in 1990 the US government finally passed a law through the US Congress allowing Native Americans to retrieve cultural treasures, sacred items and human remains from museums.

Many archaeologists panicked.

It can be difficult for scientists to fully understand how a piece of wood can become a living god and how spirits can surround bones.

And they knew that modern science, especially DNA, could provide glorious insight into the past.

Anthropologist Frank Norwick declared, "We are doing important work that benefits all of mankind.

We give nothing back to anyone. ”

All this was a mystery to me as a college student and difficult to decipher.

Why would Native Americans seek to reclaim their heritage from the very places that preserve it?

And why do scientists spend their lives studying dead Indians and show little interest in living Indians?

I graduated, but I didn't know what to do next, so I went on a trip.

One day I visited Nelson Mandela's former cell on Robben Island in South Africa.

I had an epiphany.

Here was the man who helped the country to bridge the vast chasm and seek reconciliation, even if imperfectly.

I am not Mandela, but I ask myself whether I too can plant seeds of hope in the ruins of the past.

In 2007, I was employed as a curator at the Denver Museum of Nature and Science.

Our team agreed that unlike many other institutions, we need to be proactive about our museum collecting heritage.

We started with 100 skeletons in our closet.

Months and years later, we met with dozens of tribes to find a way to bring back these remains.

And this is a lot of work.

That includes negotiating who will receive the remains, how they will be transported with respect, and where they will go.

Native American leaders become morticians, planning funerals for deceased relatives who did not want to be exhumed.

Ten years later, the Denver Museum and Indigenous Partners have reburied nearly every human skeleton in the collection.

We have returned hundreds of sacred items.

But it turns out that these battles are endless.

Repatriation is now a permanent feature of the museum community.

Hundreds of tribes are waiting their turn.

There are always museums with more.

All war gods in public museums in the United States have now been returned, with 106 returned to date, but many more beyond U.S. law are in private collections or outside the borders.

In 2014, I had the opportunity to visit five museums in Europe with Octavius ​​Theoteva, a respected Zuni religious leader, along with the God of War.

At the Ethnographic Museum in Berlin, we saw a war god with a dubious medical history.

An overzealous curator added chicken wings.

The necklace had been stolen once.

An official at the Quai Branly museum in Paris said the war gods here are now state property and there are no provisions for repatriation.

He argued that the War God no longer served the Zuni, but the museum's visitors.

“We give the world everything we have,” he said.

The British Museum warned that the Zuni lawsuit would set a dangerous precedent for larger conflicts, such as Greece's claim to the Parthenon marble.

After visiting five museums, Octavian went home empty-handed to his people.

He later told me, "It pains me to see Ahayuda in the distance.

they all belong together.

It's like a family dinner missing a member of the family.

When one person is gone, its power is lost. ”

I hope my colleagues in Europe and beyond understand that War God does not represent the end of the museum, but rather a chance for a new beginning.

When you walk through the halls of a museum, you probably only see about 1% of the entire collection.

The rest are in storage.

After returning 500 artifacts and skeletons, my museum still holds 99.999 percent of the total collection.

We no longer have a god of war, but we do have traditional Zuni pottery, jewelry, tools, clothing, and art.

And even more valuable than these items are the relationships we forged with the Native Americans during the repatriation process.

Now we can let the Zuni share their culture.

Recently, I had the opportunity to visit the returning Gods of War.

A shrine sits atop a mesa overlooking the beautiful Zuni homeland.

The shrine is surrounded by a roofless stone building, topped with barbed wire to prevent it from being stolen again.

And among them is Ahayuda, the 106 god of war, among offerings of turquoise, cornmeal, seashells and even T-shirts...

A modern gift to ancient beings.

And as I stood there, I caught a glimpse of my true purpose in the War God's world.

And then I realized that we cannot choose the history we inherit.

Today, museum curators did not loot ancient tombs or steal spiritual objects, but we can accept the responsibility of righting the wrongs of the past.

We can help restore dignity, hope and humanity to Native Americans who were once silent subjects of our curiosity.

And this does not even require a complete understanding of the beliefs of others, it is enough just to respect them.

Museums are temples to the past.

From now on, it must become a place of living culture.

As I turned away from the shrine, I breathed in the warm summer air and watched eagles circling lazily above.

It reminded me of the Zuni tribe. Their offerings ensure that their culture lives on, rather than dying and disappearing. And I couldn't think of a better place for the War God.

thank you.

(applause)

It was November 1, 2002, my first day as principal, but not my first day in the Philadelphia School District.

I graduated from Philadelphia Public Schools and spent 20 years teaching special education in low-income, low-performing schools in North Philadelphia, a city with high crime and some of the worst poverty in the country.

As soon as I entered my new school, a big fight started between the girls.

After things quickly settled down, I quickly held a meeting in the school auditorium and introduced myself as the school's new principal.

(Applause.) I walked into the room angry, a little nervous -- (laughter) -- but I was determined to set the tone for the freshmen.

I began to enumerate as forcefully as possible my expectations for their behavior and what they would learn in school.

Suddenly, a girl in the far back of the auditorium stood up and said,

miss! "

As we squinted, she said, "Why do you keep calling this place a school?"

This is not school. ”

Ashley expressed at once what I felt about her experience years ago when I attended a lower performing school in the same area, but was unable to put it into words.

That school was definitely not a school.

Fast-forward 10 years to 2012 and I entered the third worst performing school as principal.

I am the fourth principal of Strawberry Mansion in the last four years.

Due to its low test scores and high number of weapons, drugs, assaults and arrests, it was labeled as "underperforming and consistently dangerous".

Shortly after approaching the door of the new school and about to enter, he finds the door locked with a chain. "Teacher! Teacher!" I heard Ashley's voice in my ears.

This is not school. ”

The hall was poorly lit and dimly lit.

Classrooms were full of old broken furniture and desks, and thousands of unused materials and resources.

This wasn't school.

As the years progressed, I noticed that the classrooms were mostly empty.

The students were just scared. I was afraid to sit in line for fear that something might happen. They were scared because they were often teased for eating free food in the cafeteria.

They were terrified of every fight and every bullying.

This wasn't school.

And some teachers were incredibly afraid for their own safety. As such, they had low expectations of their students and themselves, and were completely unaware of their role in subverting school culture.

This was the worst of all.

Ashley was right, but it wasn't just about school.

Too many schools, for children living in poverty, school isn't really a school.

But this could change.

Let me tell you how it is done at Strawberry Mansion High School.

Anyone who has worked with me will tell you that I am known for my slogans.

(Laughter) So today I'm going to talk about the three most important things that we've been asking for change.

My first slogan is, "If you're going to be a leader, be a leader."

I always believed that it was up to the principal to decide what would or would not happen at school.

I was a principal and to hold that title I had to lead.

I wasn't going to stay in my office and delegate my work to someone else. And whether I liked it or not, I would fearlessly deal with what was not good for my children.

I am a leader, so I know I can't do anything alone.

So I assembled a top-notch leadership team that believed in the potential of all children and worked together on small things like manually resetting all locker combinations to ensure all students had access to safe lockers.

We decorated all the billboards in the building with bright, colorful, and positive messages.

We unchained the main gate of the school.

We changed light bulbs, thoroughly cleaned every classroom, recycled all unnecessary textbooks, and discarded thousands of old materials and furniture.

I used two trash cans in one day.

And, of course, we also took on big challenges, such as restructuring the entire school budget so that funds could be reallocated to more teachers and support staff.

We rebuilt the schedule for the entire school day from scratch, adding different start and end times, remedial classes, honors courses, extracurricular activities, and counseling all during the school day.

All during school days.

We created a deployment plan that specified where support personnel and police were located throughout the day and monitored them every second of the day. And, as his best invention yet, he devised a school-wide discipline program titled "Non-negotiable."

It was a behavioral system, designed to encourage positive behavior at all times.

result?

After being on the Permanently Dangerous List for five consecutive years, Strawberry Mansion was removed from the Permanently Dangerous List the first year it was --(applause)--.

Leaders make the impossible possible.

That's where my second slogan comes in. "So what?" So?

(Laughter) (Applause) When we looked at the data and met with the staff, there were many excuses as to why Strawberry Mansions were underperforming and still dangerous.

They say only 68 percent of children attend school regularly, 100 percent of them live in poverty, only 1 percent of parents participate, many come from incarceration or single-parent families, 39 percent of students have special needs, and state data reveals that 6 percent of students are proficient in algebra and 10 are proficient in literature.

After they had finished telling us how terrible the environment and the children were, I looked at them and said:

what are you going to do about it? ”

(Applause.) It became my primary responsibility to eliminate excuses at every turn.

We have addressed all of these excuses through mandatory professional development, paving the way for a focus on teaching and learning.

After many observations, we have determined that teachers know what to teach, but do not know how to teach so many children with vastly different abilities.

We have therefore developed a teaching delivery model that focuses on small group instruction, ensuring that every student can meet their individual needs in the classroom.

result?

A year later, state data revealed that our scores had increased 171 percent in algebra and 107 percent in literature.

(Applause.) We've got a very long, very long way to go, but we're approaching every obstacle right now with a mindset of, "So what do we do? Now what do we do?" attitude.

And this will be my third and final slogan.

(laughter) Even if no one said they loved you today, you remember me doing that and will continue to do so.

My students have social, emotional and financial challenges that you can't even imagine.

Some of them are parents themselves, while others are completely alone.

If anyone asks me the real secret on how to keep Strawberry Mansion truly moving forward, I have to say that I love my students and believe unconditionally in their potential.

When I look at them, I can only see what they will become. Because I am one of them.

I also grew up poor in North Philadelphia.

I understand the feeling of going to a school that is not a school.

It is understandable to wonder if there is no way out of poverty.

But thanks to my wonderful mother, I was able to have a dream despite the poverty that surrounded me.

So -- (applause) -- if I want to push my students toward their dreams and life goals, I need to know who they are.

So I have to spend time with them, so I manage the lunchroom every day.

(Laughs) So, while I'm there, I talk to them about something very personal, and on their birthday, I sing 'Happy Birthday' even though I can't sing at all.

(laughs) I often ask them, "Why do you want me to sing if I can't sing at all?"

(Laughter.) And they reply, "Because we like to feel special."

We hold monthly town hall meetings to listen to their concerns and find out what they think.

They ask us, "Why should we follow the rules?"

"Why are there so many results?"

"Why can't I just do what I want?"

(Laughter) They ask, and I answer each question honestly, and this exchange of listening helps clear up any misunderstandings.

Every moment is a teaching moment.

My reward, my reward for non-negotiating my rules and results, is the respect they earned.

I would argue so, and because of that we can get things done together.

They have a clear understanding of what I expect of them, and I repeat those expectations over the PA every day. system.

I remind them -- (laughter) I remind them of the core values ​​of focus, tradition, excellence, integrity, perseverance, and how education can truly change their lives every day.

And I conclude all my presentations in the same way. "Even if no one tells you they love you today, you will remember me doing it, and I will continue to do so."

Ashley's words, "Lady, lady, this ain't no school" are forever etched in my mind.

If we are to make real progress in tackling poverty, we need to make sure that every school that serves children in poverty is a real school, school, school that provides them with the knowledge and spiritual training to navigate the world around them.

I don't know all the answers, but what I do know is that for those of us who have the responsibility of leading a school that serves children in privileged circumstances, we must truly lead, and when faced with incredible challenges we must stop and ask ourselves:

what are you going to do about it? ”

And as we teach, we must never forget that each student is just a child and is often frightened of what the world should be like to them. No matter what the world says they should be, we must always give our students hope, unwavering attention, an unwavering belief in their potential, and consistent expectations. And we must often tell them that even if no one told them they loved them today, remember that we love them and will continue to do so.

thank you.

(Applause) Thank you, Jesus.

I love great mysteries, and perhaps because they are personal, I am fascinated by the greatest unsolved mysteries in science.

It's about who we are, and we can't help but be curious.

The mystery is this. What is the relationship between your brain and conscious experiences like the taste of chocolate or the feel of velvet?

Well, this mystery is nothing new.

In 1868, Thomas Huxley wrote, "That such marvelous things as states of consciousness result from the stimulation of nervous tissue is as inexplicable as the appearance of a genie when Aladdin rubs his lamp."

Well, Huxley knew that brain activity and conscious experience were correlated, but he didn't know why.

To science at the time, it was a mystery.

Science has learned a lot about brain activity since Huxley, but the relationship between brain activity and conscious experience remains a mystery.

why? Why is there so little progress?

Some experts believe that this problem cannot be solved because they lack the necessary concepts and intelligence.

We don't expect monkeys to solve the problem of quantum mechanics, and indeed we don't expect our species to solve it.

Well, I don't think so either. I am more optimistic.

I think we're just making false assumptions.

Fixing that might fix this issue as well.

Today I want to explain what that assumption is, why it's wrong, and how to fix it.

Let's start with the question: Do we see reality as it is?

When you open your eyes, experience what it feels like to have a red tomato a meter away.

As a result, I came to believe that in reality there is a red tomato a meter away.

The next time I close my eyes, my experience turns into a gray field, but is there really a red tomato a meter away?

I think so, am I wrong?

Maybe I'm misunderstanding the nature of my perception?

We have misunderstood our perceptions before.

We thought the earth was flat because it looks like that.

Pythagoras realized we were wrong.

And we thought that the Earth was, after all, the fixed center of the universe, because it seems so.

Copernicus and Galileo again discovered that we were wrong.

Galileo then wondered if we were misinterpreting our experience in another way.

He wrote: "I think tastes, smells, colors, etc. are in consciousness.

Therefore, if the creature were removed, all these qualities would disappear. ”

Well, that's an amazing claim.

Is Galileo correct?

Have we really misunderstood our experience so badly?

What does modern science say about this?

According to neuroscientists, about one-third of the brain's cortex is involved in vision.

If you just open your eyes and look around this room, there are billions of neurons and trillions of synapses at work.

Now this is a little surprising. Because as far as we think of vision, we think of it like a camera.

It just captures the objective reality as it is.

Now, there is a part of vision that resembles a camera. The eye is like a 130 million pixel camera with a lens in the back of the eye that focuses the image with 130 million photoreceptors.

But that alone doesn't explain the billions of neurons and trillions of synapses involved in vision.

What are these neurons doing?

Well, neuroscientists say they create all the shapes, objects, colors and movements we see in real time.

It feels like you're taking a raw snapshot of this room, but you're actually building everything you see.

We don't build the whole world at once.

We build what we need in the moment.

There are now many very compelling demonstrations of building what we are seeing.

I'll show you just two.

In this example, you can see some red discs with bits cut off, but if you just rotate the discs a bit, you'll suddenly see a 3D cube pop off the screen.

Now, the screen is of course flat, so the 3D cube you are experiencing must be your construct.

In the example below, you can see a glowing blue bar with very sharp edges moving across the field of points.

The dots don't actually move.

Just change the dot color from blue to black or black to blue for each frame.

But if you do this quickly, your visual system will create a glowing blue bar with sharp edges and movement.

There are many other examples, but these are just two examples that build what you see.

But neuroscientists have gone further.

We say that we reconstruct reality.

So when I have an experience that I describe as a red tomato, the experience is actually an exact reconstruction of the properties of a real red tomato that would exist even if I didn't see it.

So why do neuroscientists say that humans don't just build, they rebuild?

Well, the canonical argument given is usually the evolutionary one.

Those of our ancestors who saw more accurately were more likely to inherit the gene because they had a competitive advantage over those who saw less accurately.

Since we are descendants of people who have seen things more accurately, we can usually be confident that our perceptions are accurate.

You see this in standard textbooks.

For example, one textbook says, "Evolutionarily speaking, vision is useful only because it is so precise."

So the idea is that accurate recognition is better recognition.

They give you a survival advantage.

Now, is this correct?

Is this the correct interpretation of the theory of evolution?

Well, let's start by looking at some examples from the natural world.

Australian jewel beetles are dimpled, shiny, and brown.

Females cannot fly.

Males, of course, fly in search of hot females.

If you find one, you will descend and mate.

In the outback there is another species, Homo sapiens.

Males of this species have huge brains, which they use to hunt for cold beer.

(Laughter) And when they find a bottle, they drain the water and sometimes throw the bottle out into the bush.

Now, incidentally, these bottles are dimpled, shiny, and just the right shade of brown to tickle your beetle's fancy.

Males crowd around the jar in an attempt to mate.

They lose all interest in real women.

A classic case of a man leaving a woman in a bottle.

(Laughter.) (Applause.) This species is almost extinct.

Australia had to replace the bottle to save the beetles.

(Laughter) Well, males have managed to find females for thousands, maybe millions of years.

It seems that he is looking at reality as it is, but apparently it is not.

Evolution gave them a hack.

Females are dimpled, shiny and brown, the bigger the better.

(Laughter) Crawling over the bottle, the male couldn't find his mistake.

Sure, beetles are very simple creatures, but they're certainly not mammals.

Mammals do not rely on tricks.

Well, I won't go into detail on this, but you get the idea. (Laughter) So this raises an important technical question: Does natural selection really prefer to see reality as it is?

Luckily, you don't have to wave your hands and guess. Evolution is a mathematically exact theory.

You can check this using the equation of evolution.

You can race different creatures in an artificial world to see which survive, which thrive, and which sensory systems are more adapted.

A key concept in these equations is fitness.

Think about this steak. What does this steak do for animal fitness?

Well, for a hungry lion seeking food, it enhances fitness.

For well-fed lions wanting to mate, it's not a strength boost.

And no matter what condition the rabbit is in, fitness does not improve. So fitness depends on reality, but also on the organism, its state and its behavior.

Fitness is not the same thing as reality itself. Fitness, not reality itself, is at the center of the evolutionary equation.

So my lab has run hundreds of thousands of evolutionary game simulations on a large number of randomly chosen worlds and creatures competing for resources in those worlds.

Some organisms see all of reality, some see only part of reality, and some see no reality at all, only adaptability.

who will win?

Well, I hate to say it, but the perception of reality disappears.

In almost all simulations, organisms that do not see reality at all, but are merely fitness-tuned, drive extinction to all organisms that perceive reality as it is.

In other words, evolution does not support truthfulness or accurate perception.

That perception of reality disappears.

Now this is kind of surprising.

How does not seeing the world accurately give us a survival advantage?

It's a little counter-intuitive.

But remember the jewel beetle.

Buprestidae have survived for thousands, perhaps millions, of years using simple tricks and hacks.

The evolutionary equation tells us that all living things, including us, are in the same boat as the beetle.

We do not see reality as it is.

We are shaped by the tricks and hacks that keep us alive.

Still, you need the help of your intuition.

How is it useless not to perceive reality as it is?

Luckily, there's a metaphor that helps a lot. It's your computer's desktop interface.

Consider the blue icon for the TED talk you're writing.

The icon is currently a blue rectangle and is located in the lower right corner of the desktop.

So the text file in my computer is itself a blue rectangle, in the lower right corner of my computer?

of course not.

Those who think so misunderstand the purpose of the interface.

It is not meant to represent computer reality.

In fact, it exists to hide that reality.

I don't want to know about diodes and resistors and megabytes of software.

If you have to deal with it, you can't create text files or edit photos.

The idea is that evolution has given us an interface that hides reality and guides adaptive behavior.

Your current perception of space and time is your desktop.

A physical object is just an icon in your desktop.

There is an obvious objection.

Hoffman, if you think a train going 200 miles an hour down a railroad track is just an icon on your desktop, why not come forward?

And after you're gone, and if your theory is with you, we'll see there's more to that train than just an icon.

Well, I wouldn't go in front of that train for the same reason I wouldn't carelessly drag that icon to the trash. It's not because I'm taking the icon literally, the file isn't literally blue or rectangular, but I take it seriously.

Weeks of work can be lost.

Similarly, evolution has shaped us with perceptual symbols designed to keep us alive.

We should take them seriously.

If you find a snake, do not pick it up.

If you see a cliff, don't jump off it.

These are designed to keep us safe and we should take them seriously.

That doesn't mean it should be taken literally.

It's a logical error.

Another rebuttal: Nothing really new here.

Physicists have long said that the train's metal looks solid, but is actually mostly empty space with tiny particles flying around.

Nothing new here.

Well, not exactly.

This is like saying that you know the blue icons on your desktop aren't computer reality, but if you pull out your trusty magnifying glass and look closely, you can see tiny pixels and that's computer reality.

Well, it's not. you are still on your desktop. That's the point.

These tiny particles still exist in space-time and still exist in user interfaces.

I mean, I'm saying something far more radical than those physicists.

Finally, you might object, see, we all see trains, so none of us build trains.

But remember this example.

In this example, we see a cube, but since the screen is flat, the cube we see is the cube we create.

We all see a cube because each of us constructs the cube we see.

The same goes for trains.

We see trains because we see trains that we build, and the same applies to all physical objects.

We tend to think of perception as a window into reality as it is.

Evolutionary theory tells us that this is a misinterpretation of our perception.

Rather, reality resembles a 3D desktop designed to hide the complexities of the real world and guide adaptive behavior.

The space you perceive is your desktop.

A physical object is just an icon in that desktop.

We thought the earth was flat because it looked flat.

And because it looks like it, I thought the Earth was the immovable center of reality.

we were wrong

We misunderstood our perceptions.

We now believe that space-time and matter are properties of reality as they are.

Evolution teaches us that we are wrong again.

We misunderstand the content of our perceptual experience.

There are things that exist without being seen, but they are not space-time or physical objects.

It is difficult for us to let go of space-time and objects in the same way that a jewel beetle lets go of a bottle.

why? Because we are blind to our own blindness.

But we have an advantage over the beetles. It's science and technology.

Looking through the lens of a telescope showed that the Earth was not the immovable center of reality, and peering through the lens of evolutionary theory showed that space-time and objects were not real properties.

When I have a perceptual experience that I describe as a red tomato, I am interacting with reality, but that reality is not a red tomato, nor is it like a red tomato.

Similarly, when I have an experience that I describe as a lion or a steak, I am interacting with reality, but that reality is not a lion or a steak.

And here's the kicker. When I have a perceptual experience that I describe as a brain or neuron, I am interacting with reality, but that reality is neither a brain nor a neuron, nor like a brain or neuron.

And that reality, whatever it is, is the real source of cause and effect in the world, not the brain or neurons.

There is no causal relationship in the brain or neurons.

They do not trigger our perceptual experiences or actions.

Brains and neurons are species-specific sets of symbols, or hacks.

What does this mean for the mystery of consciousness?

Well, it opens up new possibilities.

For example, perhaps reality is a giant machine that triggers our conscious experiences.

I doubt this, but it's worth looking into.

Perhaps reality is a vast interacting network of conscious agents, both simple and complex, that cause conscious experiences with each other.

Actually, this is not as far-fetched an idea as it sounds, and we're still considering it.

But here's the point. Letting go of our highly intuitive yet highly deceptive assumptions about the nature of reality opens up new ways of thinking about life's greatest mysteries.

Reality will surely be more fascinating and unexpected than we imagined.

Evolution gives us the ultimate courage. Let us dare to recognize that knowledge is not about seeing the truth, but about having children.

By the way, even this TED is only in your head.

thank you very much.

(Applause) Chris Anderson: If it really is you, thank you.

A lot can happen from here.

So, first of all, some might be horrified at the thought that if evolution doesn't turn out to be a real favour, it will, to some extent, undermine all our efforts here, all our ability to think that if you go there you can think the truth, perhaps including your own theories.

Donald Hoffman: Well, that doesn't stop science from succeeding.

What we have is one of the theories that turned out to be false, that perception resembles reality, and reality resembles our perception.

That theory turns out to be false.

Now, drop that theory.

That doesn't stop us from postulating all sorts of other theories about the nature of reality, so recognizing that one of our theories was wrong is actually an advancement.

So science continues as usual. No problem here.

CA: So you think it's possible -- (laughter) -- which is cool, but what you're saying is that evolution still has the potential to make inferences.

DH: Yes. This is a very good point.

The evolutionary game simulations I've shown are specifically about perception and show that our perception has been shaped not to show reality as it is, but that doesn't mean the same for our logic and mathematics.

We haven't run these simulations, but I'm sure you'll find that there is some selection pressure for our logic and mathematics to at least go in the direction of truth.

I mean, if you're like me, math and logic aren't easy.

We don't get everything right, but at least the pressure of choice isn't uniformly moving away from true math and logic.

So you'll find that we need to look at each cognitive function one at a time to see how evolution affects it.

What is true about perception may not be true about mathematics or logic.

CA: So what you're actually proposing is like a modern-day Bishop of Berkeley's interpretation of the world. Consciousness causes matter, not the other way around.

DH: Well, it's a little different than Berkeley.

Berkeley thinks so, he's a deist, he thinks the ultimate nature of reality is God or something, and I don't have to go where Berkeley goes, so it's very different from Berkeley.

I call this conscious realism. It's actually a very different approach.

CA: Don, I could literally talk to you for hours and would love to.

I'm really thankful to you. DH: Thank you. (applause)

This is a game called "Sell/Buy/Date".

This is the first time since "Bridges and Tunnels" on Broadway, but this time I - thank you - have excerpted it for you, so here it is.

right. Make sure all electronic devices are turned off before class begins.

So class, I hope you understand what I just said -- ?

Good, mobile phone announcement.

right? It was also called a mobile phone.

Remember, people back then had external electronics, yes, this stuff, and everyone would carry one of those around. And one of their greatest fears was pure frustration that the device might ring at some inconvenient moment.

right? So here's a bit of trivia about that era.

(Laughter) So the format for today's class is that today I'm going to introduce you to several BERT modules from that period in history. So, starting around 2016.

And remember. This was the first year of the BERT program.

So you have to go through quite a few of these.

Remember, as I remember in Unit 1, I will be living in a variety of different bodies, different ages, and what were then called races or ethnic groups.

And -- (laughter) -- and along the gender continuum, I would live as a man.

It was pretty binary back then.

(laughter) Also, don't forget. We're reading next week's gender-focused book module.

Now, I'm sure some of you have requested a book in pill form.

I know some people still believe that ingestion is better for memory retention, but since we're trying to experience what our ancestors did, let's just think about what we actually read.

Also, how many people are involved in your emotional short circuit?

right. Please turn it off. have understood?

I know it's hard, but I want you to feel the full range of natural emo.

This part of the syllabus is essential.

Yes Macy

have understood. got it. If you don't feel like -- OK, we'll talk about that after class.

Ok, we'll discuss your concerns.

just relax. No one died and went to compost.

have understood. after school. have understood? after school.

Let's begin.

This initial subject was identified as a middle-class housewife.

Remember, the initial modules of these people's full identities were protected and this allowed them to speak more freely about our topic, which was taboo for many of them.

Well, honey, you're ready.

No, sweetheart, I said, always ready.

I'm freezing.

This recording studio is like a meat rocker.

I should have brought the schmata.

Even with all this great technology, we can't afford heat.

what is he saying? i can't hear you!

I can't hear you through the glass, honey!

I have you in my ears

oh can you hear me?

all the time.

Oh yes it's a little chilly.

Yes, oh, it's cold because of machines and new technology. have understood.

Yes, remember again, are you recording not only my voice, but also my emotions and memories? right.

Yes BERT, yes I read about it.

Biosympathetic resonance technology.

So yes, so people can feel my experiences and memories? have understood.

No, I'm ready.

I was wondering if they would do a test to see how my memory was doing.

I was about to say it's too late, now it's bad news.

No, no, please, honey.

Oh that's the first question?

What do you think about prostitution?

Young man, are you inviting me?

I've heard of May-December romance, but what are you like when you're around 20?

eighteen? eighteen years.

I think I have 18+ candy in my purse.

(laughter) You're kidding me, sweetheart. No, you can ask any question.

of course. And about prostitution – oh, sex workers, sex workers.

No, in my time alone it was called prostitution, not sex work.

Oh, because it also contains porn?

have understood.

No, well, when I was a girl, I don't think we even had that name.

I think you said dirty magazines or dirty movies.

Well, it's nothing like the Internet.

No, well, you can share it.

My late husband and I were a very romantic couple.

A lot of kindness, I see.

Well, as I got older, at some point I thought it might be helpful for my husband to use drugs that men can take, but he wasn't interested in such drugs, so I thought why not watch adult videos on the internet.

Just for inspiration, please understand.

Well, neither of us were very good with computers at the time, so if we needed help with the internet, we would normally just call our kids or grandchildren, but obviously that wasn't an option in this case, so I thought I'd take a look for myself just to be sure.

How hard would that be?

Search specific keywords and find out -- Oh, you're right, young man.

You can't imagine what I saw.

Well, first of all, I was trying to find a couple, a normal couple in love, and there were so many people at once.

I couldn't tell which part belonged to which body.

I have no idea how they set up the cameras to film this part.

But the only thing they didn't catch was love.

There was a lot to create, but they took the love part out of it: the fun.

It was all very extreme, you see?

As you say, for extreme sports.

Lots of patience but never kindness.

Anyway, needless to say it was $19.95 never coming back, it just showed up on my credit card as "entertainment services". Therefore my husband was never wise. And after all that, we can say that it turned out that he didn't need any additional inspiration after all.

Okay, so the next subject is a young woman -- (applause) -- the next subject, the class is a young woman named Bella. She is a college student who was interviewed for a class called Introduction to Feminist Pornography as part of her Sex Work major at a Bay Area college in 2016.

(Laughter) Yeah, I just want to get a recording of you guys recording me, a meta recording or something.

This whole experience is so amazing that I want to document it on Instagram and Tumblr.

So, hello everyone, I'm Bella. And I'm being interviewed right now about bioempathic resonance technology, which is really amazing. This is basically recording where they are, as you can see from these electrodes, neuropeptide formation in my hippocampus, etc.

They can later reconstruct these as my own real memories and real experiences so others can actually feel what I am feeling right now too.

have understood. have understood.

So, hello, future BERT person experiencing me.

This feels like a freshman in college, and headaches like this you're experiencing through me are like the lingering effects of the Jell-O shot I made last night at the bi-weekly feminist pole dance party I co-host Wednesday.

It's called "Don't Get All Pole-Emical" -- (laughter) -- it takes place at Beekman Hall, and there are other non-Jello shots available for vegans.

For the record, I major in Sex Work Studies, but have a minor in Social Media, with a focus on notable YouTube memes.

(Laughter) Yes, of course, I consider myself a feminist.

I am named after Bella Abzug, a famous feminist in history, but I also feel it is important to represent women like sex-positive feminists.

What is Sex Negative?

Well, what do I mean by sex negative? I would ask. (Laughter) Yes, because the terms we use are very important. Because we call it sex work because it helps people understand that it is work. And, you see, because we see these workers as sex care providers, just as we have health care providers and insurance providers.

Yes, but I don't believe that providing direct sex care services is per se a requirement for me to be an advocate.

For example, I support the right of other women to choose it voluntarily if they enjoy it.

Yes, but I consider myself more likely to defend the legal freedoms and rights of sex workers in the future.

Well, basically I'm going to be a lawyer.

yes, class. (Laughter) (Applause) The next two modules are also from circa 2016.

One of the subjects is an Irish woman with a particularly notable connection to the issue, the first being a West Indian woman, a self-proclaimed bodyguard who has been recorded at sex workers' rights rallies and parades.

She was interviewed while marching in a carnival headdress and little else.

Okay, start talking now.

Yes, I said the wire can be placed anywhere as long as it doesn't get in the way.

Yeah, no, but tell me again, what's that name? BERT? Bert.

Yes, like I said before, I think I've had at least one client with that name before, so this isn't the first time I've been plagued by BERT.

Oh, I'm sorry, but if you're going to interview me, take it seriously.

have understood? I can say that.

No justice, no pieces! No justice, no pieces!

But can you see the signs? Do you understand? piece. No justice, no part of us.

you understand?

Well, what I told you was that when I first came to this country, I did every job I could find.

I was a nanny. I was a home caretaker for various old people, and then I said, if I have to touch other white men's buttocks, I'd rather get more money than that, you know?

Shhh, do you know how hard it is to be a domestic worker?

Some of these men are heavy.

You have to pick them up and turn them over.

Well, I had them pick me up and turn me over, you see?

Well, I think you should have a sense of humor about it.

No, but listen, I have someone who doesn't hate certain parts of the job.

I mean, there are a lot of things I don't like about this job, and money isn't one of them. And as much as this is my best chance of making real money, I'm going to be a Jamaica real man if that's what they want to call me.

No, I'm not from Jamaica either. That's how they sell me.

My family hails from Trinidad and the Virgin Islands.

They don't know what I'm doing, but what do you know?

My children, they know they are paid for school, they have books and computers. I know they have a chance this way.

So I'm not going to say what I'm doing is easy, I'm not going to say I feel - what do you mean by liberated?

But let me tell you that I feel I am being rewarded.

right. (Applause) Thank you, that's nice. A cup of tea, love and a little whiskey.

It's perfect, it's great Just one more drop. splash. Perfect.

what was your name Peter? Is that right, Peter?

right. So that's the unique part for me, yes, it ended up being both a convent first and then a prostitute. That is correct.

(Laughter.) A college lady here in Dublin wrote about me.

She said Maureen Fitzroy is a living embodiment of the whore-virgin dichotomy.

right? (Laughter) Don't you think it's like having to be hospitalized?

Well, I have this horrible dichotomy.

That's right.

right. But for me, as a girl, it started with my father.

So half of the time he spoke to us, it was like we're all useless rotten idiots and morally deficient.

And I certainly didn't do myself any favors.

By the time I was 16, I was starting to get involved with this older man, and he wanted it to be our little secret, so I did as I was told, right?

No, that old man will still come to the monastery looking for me.

Yes, he shoved the note into the brick hole behind the charity shop so we could meet.

And he told me he was going to leave his wife and I believed him at his word until I got pregnant.

Peter, I left a note about it in a special place, but I never heard from him again.

No, I put him up for adoption so that he could have a decent life, but I couldn't put him back in the convent.

No, my sister Virginia gave me $5 as a coach to Dublin and that's how I got here.

Well, to my surprise, to my surprise, I fell in love with another guy who was much older than me and I always say, he was so happy he didn't drink, I married that bastard.

Well, he didn't drink, but he had a bit of a heroin problem, and--yes, and before I knew it, it was he, my husband, who got me hooked.

He let me support both of us.

i was 18 years old.

Well, it wasn't Pretty Woman, I can tell you.

If that Julia Roberts had to sleep with a man to put a few pounds in her pocket, I don't think she would have made that movie.

Well, just to be clear, my opinion on legalization is that I disagree.

But I don't care what these young girls say.

Living like that just makes me feel lost, and I'm already 63 years old.

I'm still trying to find out who I am.

You see, I was neither a wife nor a nun nor a prostitute.

No one asked me what I wanted to be.

That's what they told me, but if you legalize it, you're actually telling them, 'Go ahead and get lost,' and many of them will do what they're told.

got it. Four perspectives from four very different voices -- (applause) -- four very different voices out there.

One woman said that while sex itself is natural, the sex industry seems to have mechanized or industrialized it.

Second, a second woman, who thought sex work was empowering, liberating, and feminist, seemed particularly reluctant to engage in sex work herself.

A third woman, who was actually a so-called sex worker, did not agree that it was liberation, but wanted the right to economic empowerment. And you hear the fourth woman say she never found out who she was, not only because of prostitution itself, but because of roles that women are generally prohibited from, right?

So, another fact that most people didn't know is that the average age of girls at risk of being introduced into the sex industry was 12 or 13.

Consider also that the age at which all girls in that society were first exposed to sexual images of women was quite early.

This is a Barbie doll, right?

At first I thought of her as an educational tool for anorexia prevention -- (laughter) -- but in reality she was considered by many to be a healthy symbol of femininity, and young girls often started so-called diets.

remember this? This led them to deliberately limit their food intake by the age of 6 and by the same time to define themselves based on their attractiveness. right?

yes?

Well, Bradley, okay, great point.

So there was a market in that society that made money by convincing everyone they had to look a certain way to have a sex life?

But girls in particular were expected to be "sexy" while avoiding being seen as "sluts" for being sexual. right?

So there's that shameful article we heard.

yes.

Valerie, right? Ok, very good.

Of course, men had sex too, but you read and remember, what were male sluts called?

Very nice, they called men.

(Laughter.) (Applause.) It's not easy to live in such a world, is it?

It wasn't all bad news, though.

Most women in the early 2000s thought they were empowered, and men generally felt they were evolving in this area as well. In fact, most people would have been aware of issues such as human trafficking, for example, but would have viewed it as something completely separate from more recreational adult entertainment.

So, we don't have much time in class, so at this stage, we will hear a brief talk from a man about our theme.

There, the following subjects were interviewed on the night of the bachelorette party.

Hey, okay, can you shut up?

I'm trying to talk to BERT now.

Oh, your name is not BERT.

BERT is its name. Ah, understood.

No, no, no, no, it's totally fine. I'm mostly sober and just want to be helpful.

Yeah, I totally believe the cause, yeah, all that stuff.

(Laughter) And actually, I'm wearing Tom now.

Yes, when Tom and his friends buy a pair of shoes, African children can get clean water.

yes. completely.

But what was the question again? sorry.

Of course I believe in women's rights. i am married to a woman.

(Laughter) No, but I mean, just because I'm in a strip club parking lot doesn't mean I'm sexist or anything.

My fiancée is absolutely amazing, she is a really strong girl, woman, smart woman.

Yeah she knows I'm here She's probably in a strip club now too, just kidding, just like me.

My best friend, I told him he could surprise me and he thought this would be funny but this is nothing.

Yes, we all went to B school together.

Wharton.

(Laughter) Yeah, so, hey guys, can you -- ok. But since this is my bachelor party, I can hang out with Anderson Cooper in the parking lot if I feel like it.

All right, let's meet there.

Okay, so Anderson, I mean, first of all stripping, but then everything else you're talking about, prostitution and so on, it's not exactly the same thing.

Look? For example, you keep calling it the sex industry or whatever, but if a girl wants to be an exotic dancer and she's 18, that seems to be her right.

Whoops, whoops, I hear what you're saying, but I have a feeling people just want to make it look like every dude is just a predator, automatically going to whores or whatever.

For example, when I take vows, for example, even when I rush to fraternity.

My close brothers and those people are all the same as me.

There's a myth that we're just normal people, but you must be an asshole.

And really, brothers, it's not what it sounds like.

This is actually more of a joke to say that you care about your siblings and put them first.

Yes, but you can't blame the media.

So, for example, if I watch The Hangover 2 and think it's the instruction manual for life, I don't know what to say.

Look? I don't watch The Bourne Identity and then drive to Venice for a gondola ride. (Laughter) Well, okay, if you're a little kid or something like that, of course it's different, but - yes, okay, I remember one thing like that.

I was playing GTA in this kid's house once, uh, Grand Theft Auto?

Hey are you from Canada? (Laughter) So, for example, in Grand Theft Auto, you can be this kid, this guy walking around, and basically, the more cops you kill, the more points you get, and so on.

But you can also find prostitutes, and of course you can have sex with them, but you can also kill them and get your money back.

Yes, I remember running over this kid a few times and getting those points.

I think there were about 10 of us.

It felt pretty awful, actually.

No, I don't think I said anything, I just finished playing and left.

Now, some men had more than just a passing relationship with this issue. (Laughter) The next subject described himself as a converted and reflective pimp turned motivational speaker, life coach, and therapist, but if you want to know more about him, you'll have to visit the entire play.

Thank you so much to all the beautiful TED viewers.

Let's meet at "Sell/Buy/Date".

(applause)

Our emotions influence every aspect of our lives, from how we stay healthy and learn, to how we do business and how we make decisions big and small.

Our emotions also affect how we connect with each other.

We evolved to live in a world like this, but instead we live more and more lives like this, in an emotionless world. This is a text message from my daughter last night.

So I have a mission to change that.

We want to bring emotion back into our digital experiences.

I started down this path 15 years ago.

I work as a computer scientist in Egypt and had just been accepted for my PhD. Program at the University of Cambridge.

So I did something very unusual for a newly married Muslim Egyptian young wife. I packed up and moved to England with the support of my husband who had to stay in Egypt.

Thousands of miles from home in Cambridge, I find myself spending more time on my laptop than I do with other human beings.

But despite this intimacy, my laptop was completely oblivious to my feelings.

Not knowing if I was happy, having a bad day, or stressed and confused, I was frustrated.

To make matters worse, communicating with my family back home online made me feel like all my emotions had disappeared into cyberspace.

Some days I was homesick, I was lonely, I was actually crying, but this was the only time I had to express these feelings.

(Laughter) Today's technology has a lot of I.Q. but no E.Q. We have a lot of cognitive intelligence, but no emotional intelligence.

So I wondered what if our technology could sense our emotions.

What if our devices could sense our feelings and react accordingly, just like our emotionally intelligent friends?

These questions have guided me and my team to develop technology that reads and responds to our emotions. Our starting point was the human face.

In short, our human face is one of the most powerful channels we all use to communicate our social and emotional states, such as fun, surprise, empathy, and curiosity.

In emotional science, facial muscle movements are called action units.

For example, action unit 12 isn't a Hollywood blockbuster, it's actually the corner-pulling action of the lips, which is the main component of a smile.

Everyone should try it. Let's keep smiling.

Another example is action unit 4. It's the wrinkle between the eyebrows.

All these textures and wrinkles are created when you draw your eyebrows together.

We don't like them, but it's a strong indicator of negative emotions.

So there are about 45 of these action units that can be combined to express hundreds of emotions.

Teaching a computer to read these facial emotions is difficult. These units of action can be fast, they can be subtle, and they can be combined in many different ways.

For example, consider smiles and smirks.

They are a bit similar, but have very different meanings.

(Laughter.) So a smile is positive, but a fake smile is often negative.

Sometimes a smirk can make you famous.

But seriously, it's important for a computer to be able to tell the difference between the two expressions.

So how do we do that?

We give the algorithm tens of thousands of examples of people of various ethnicities, ages and genders who we know are smiling, and we do the same with our smirks.

Then, using deep learning, the algorithm searches for all the textures, wrinkles, and shape changes in our faces, basically learning that all smiles have common traits and all smirks have subtly different traits.

And the next time it sees a new face, it basically learns that this face has the same characteristics as a smile, and says, "Oh, I recognize this one. This is a smiling expression."

So the best way to demonstrate how this technology works is to try a live demo. That's why we need volunteers, preferably people with faces.

(laughs) Chloe will be volunteering today.

So over the past five years, we've moved from an MIT research project to an enterprise, and my team has been working hard to make this technology, as we like to say, really work.

We also scaled it down so that the core emotion engine works on camera-equipped mobile devices like this iPad.

So let's try this.

As you can see, the algorithm basically found Chloe's face. So it's this white bounding box that tracks the main feature points of her face: eyebrows, eyes, mouth, and nose.

The question is whether you can recognize her facial expressions.

So let's test the machine.

So first of all, show us your poker face. Yeah, great. (Laughter) And when she smiles, this is a genuine smile, which is great.

You can see the green bar go up when she smiles.

It was a big smile now.

Could you try a subtle smile to see if the computer recognizes it?

It also recognizes subtle smiles.

We have worked hard to make that happen.

Then he raised his eyebrows, showing surprise.

A furrow between the eyebrows is a sign of confusion.

frown. Yes, perfect.

So they are all different units of action. There are many others.

This is just a simplified demo.

But we call each reading a sentiment data point, and we can combine them to express different emotions.

On the right side of the demo, it looks happy.

It's a pleasure. Joy flares up.

and make a disgusting face.

Remember when Zayn left One Direction?

(laughter) Yes, wrinkle your nose. wonderful.

And the valence is actually quite negative, so you must have been a big fan.

So value is how positive or negative the experience is, and engagement is also how expressive she is.

So imagine if Chloe could access this real-time emotional stream and share it with anyone she likes.

thank you.

(Applause.) So far, we've accumulated 12 billion of these sentiment data points.

This is the world's largest emotion database.

We collected this information from 2.9 million facial videos, people who agreed to share their emotions with us, and people in 75 countries around the world.

Growing day by day.

It amazes me that we can quantify something as personal as emotion and do it on this scale.

So what have we learned so far?

gender.

Our data confirms what you might suspect.

Women are more expressive than men.

Not only did they smile more, they smiled longer, and we could actually quantify the difference in how men and women responded.

Let's do the culture: In the US women are 40 percent more expressive than men, but strangely in the UK we see no difference between men and women.

(laughs) Age: People over 50 are more emotional than younger people.

Women in their 20s smile more than men their age, which is probably a must for dating.

But perhaps what surprised us most about this data is that we are consistently expressive, not just when we're watching cat videos on Facebook, but even when we're sitting alone in front of our devices.

We are also expressive when emailing, texting, shopping online, and paying taxes.

Where is this data currently used?

By understanding how we interact with the media, we understand virality and voting behavior. And I also want to touch on technologies that empower or enable emotions. I would like to share some examples that are especially close to my heart.

Emotionally-enabled wearable glasses help people with visual impairments read other people's faces and help interpret emotions that people on the autism spectrum really struggle with.

In education, imagine a learning app sensing when a user is confused and slowing down, or sensing boredom and speeding up learning, much like a good teacher does in a classroom.

What if your watch tracked your mood, your car sensed when you were tired, or your refrigerator recognized when you were stressed and locked itself to prevent overeating? (laughs) I would like to, yes.

What if, when you were in Cambridge, you had access to a real-time emotional stream and could share it with your family back home in a very natural way? As if we were in the same room.

In five years, I think all our devices will have emotion chips. And we can't remember what it felt like when we couldn't frown at the device and the device said, "Hmm, you didn't like that?"

Our biggest challenge is the sheer number of applications for this technology. My team and I recognize that we can't build everything ourselves, so we made this technology available for other developers to build and unleash their creativity.

We are aware of the potential risks and potential abuses, but personally, having spent many years doing this, I believe that the benefits to humanity of having emotionally intelligent technology far outweigh the potential for abuses.

Everyone is welcome to join the conversation.

The more people who know about this technology, the more we can all have a say in how it is used.

So as our lives become more and more digital, we are fighting a losing battle trying to limit our use of our devices to regain our emotions.

So what I'm trying to do instead is bring emotion into technology and make it more responsive.

So I want the devices that were separating us to bring us back together again.

And by humanizing technology, we have the perfect opportunity to rethink how we connect with machines and, by extension, with each other as humans.

thank you.

(applause)

A good way to understand my take on simplicity is to look at TED. You who are here understand without any difficulty why we are here and what is happening.

On the best A.I. Earth, you'd find it complicated and obscure, and my little dog Watson might find it simple and understandable, but you'd miss the point.

(Laughter) I'm sure he'll have a good time.

And of course, if you're a speaker like Hans Rosling, you'll find this story complicated and unwieldy. But in the case of Hans Rosling, he had a secret weapon yesterday in the act of literally swallowing a sword.

And I have to say, I thought of quite a few objects to swallow today and eventually gave up, but he just did it and it was great.

So Puck meant not only that we are pejoratively stupid, but that we are easily fooled. In fact, what Shakespeare was pointing out is that we go to the theater to be fooled, so we actually look forward to it.

We go to magic shows to be tricked.

This makes a lot of things fun, but it also makes it difficult to have any real image of the world we live in or ourselves.

And our friend Betty Edwards, a woman who "paints on the right side of the brain," shows these two tables to her drawing class and says, "The problem with learning to draw is not that you can't move your hands, but that the way your brain perceives images is flawed.

You're trying to perceive the image as an object instead of looking at what's there. ”

And to prove it, she says: "The exact size and shape of these table tops are the same. I'll try to prove it."

She does this on cardboard, but I have an expensive computer here, so let's spin this little guy...

I use this in all my talks, so I've seen it hundreds of times, and I still don't see that they're the same size and shape, and I don't think you will either.

So what do artists do? Well, what artists do is measure.

They measure very carefully.

And if you measure very carefully with a stiff arm and a straight blade, you'll find that these two shapes are exactly the same size.

And the Talmud saw this long ago and said, "We don't see things as they are, we see them as they are."

I certainly would like to know what would have happened if someone with that insight at the time actually ran that insight to its final conclusion.

So if the world is not what it seems and we see things as they are, then what we call reality is a kind of hallucination happening here. Understanding that it is a waking dream and that it is what we actually exist is one of the greatest epistemological barriers in human history.

What that means is that the words "simple and straightforward" may not actually be simple or understandable, and what we think of as "complex" can be simple and straightforward.

To avoid my shortcomings, I need to understand myself somehow.

We can think of ourselves as a kind of noisy channel.

In my opinion, we cannot learn to see until we admit that we are blind.

When you start at this very humble level, you can start to find your way of looking at things.

And what has happened, especially in the last 400 years, is that humans have invented "brainlets," small extra parts of our brains, made from powerful ideas that help us see the world in different ways.

And they take the form of sensory devices, telescopes, microscopes, reasoning devices, different ways of thinking and, most importantly, the ability to change the way we see things.

I'll talk about that for a minute.

It is precisely this shift in perspective about what we perceive that has helped humanity progress further than the rest of human history in the last 400 years.

Nevertheless, as far as I know, it is not taught in any curriculum from kindergarten through high school in America.

So it's when you do more that things change from simple to complex. we like more

Simplicity becomes complicated when you do more in some kind of silly way, and in fact you can keep doing it for a very long time.

But Murray Gelman spoke yesterday of its emergent nature. Another name for them might be "architecture" as a metaphor for taking the same old material and thinking of non-obvious and non-simple ways to put it together.

And indeed, what Murray was talking about yesterday about the fractal beauty of nature—that the descriptions on various levels are pretty similar—all comes down to the idea that elementary particles are both cohesive and solitary, and in vigorous motion.

These three factors create varying levels of complexity in our world.

But how easy is it?

So when I saw Rosslings' Gapminder work a few years ago, I thought it was the best I've seen in terms of conveying complex ideas in a simple way.

But then I had the thought, "Hey, maybe that's too simple."

And I made a little effort to see how well these simple depictions of trends over time really matched up with some of the ideas and investigations from the side, and found they matched up quite well.

So the Roslings were able to keep it simple without removing anything important in their data.

As a former molecular biologist, I didn't like it at all, in contrast to the movie we saw yesterday of a simulation of the inside of a cell.

Not because it's not beautiful, but because it leaves out something most students don't understand about molecular biology. That is why two complex shapes can find each other in the right way, combine and be catalyzed.

And what we saw yesterday was that all reactions were by chance. They just plummeted into the air and were restrained, and then something happened.

But in reality, these molecules are rotating at a speed of about 1 million revolutions per second. They rock their size back and forth every 2 nanoseconds. They are completely densely packed, jammed, and bumping into each other.

And if you don't understand the mental model for this, what's going on inside your cells can seem completely mysterious and accidental. And I think that's just the wrong image when trying to teach science.

So another thing we do is confuse adult sophistication with an actual understanding of some principle.

So a 14-year-old in high school will understand this version of the Pythagorean theorem. This is a really subtle and interesting proof, but really it's not a good way to start learning mathematics.

So a more direct one, one that gives more of a sense of mathematics, is closer to Pythagoras' own proof, which goes like this: Notice that we have this triangle here, and if we surround that C square with 3 more triangles and copy it, we can move these triangles down like this:

That leaves us with two weird free spaces...

and bingo. That's all there is to do.

And this kind of proof is literally the kind of proof you need to learn when you study mathematics to make sense of it before you can even examine the 1,200 or 1,500 proofs of the discovered Pythagorean theorem.

Then go to the young children.

This teacher was a kindergarten and first grade teacher, but he was a natural mathematician, which is very rare.

So she was like a jazz musician friend who never studied music but was a great musician. She was only interested in mathematics.

And here are her 6-year-olds and she's letting them build shapes out of shapes.

So they choose a shape they like, such as a rhombus, square, triangle, or trapezoid, and try to make the next big shape of the same shape, and the next big shape after that.

The trapezoid turns out to be a little more difficult.

And what this teacher did with every project was make the kids act as if it was first a creative art project and then something like a science.

So they created these crafts.

Well, she saw them and made them do this... I thought so for a long time until she explained to me that it was a hassle, to slow them down as they thought.

So they're cutting and pasting small pieces of cardboard here.

But the point of this is for them to see and fill in this table.

"Did you notice anything about what you did?"

And 6-year-old Lauren there realized that the first took one, the second took three more, and the total cost that one four, the third five more, and that one and the next one a total of nine.

She quickly realized that the additional tiles she needed to add around the edges were always incremented by 2, so she was very confident in how she made those numbers there.

And she knew that these were square numbers until about six o'clock. She wasn't quite sure what 6 times 6 was or what 7 times 7 was, but then she felt confident again.

That's what Lauren did.

Then, when teacher Jillian Ishijima instructed the children to bring all their projects to the front of the room and put them on the floor, everyone roared, "Oh no! It's the same!"

Whatever the shape, the laws of growth are the same.

And the mathematicians and scientists in the crowd will recognize these two sequences as the 1st and 2nd order discrete differential equations derived by a six-year-old.

Well, that sounds pretty cool.

That's not what we usually try to teach six-year-olds.

Now let's see how a computer can be used for such purposes.

So the first idea here is to show what the kids are doing.

I use the software that comes with my $100 laptop.

So I want to draw a small car here, draw it quickly, and put on big tires.

Here you can get a small object and peek inside this object. This is called a car. Here's a little in action. The car moves forward.

The car will rotate with each click.

If you want to create little scripts to do this over and over, just drag them in and let them run.

You can try to steer the car here...

Can you see the car turning here by 5 o'clock?

So what happens when you click this all the way to zero?

Go straight. That's a big revelation for a nine-year-old.

Please go in another direction.

But of course, it's a bit like kissing your sister when it comes to driving a car, so kids want to get behind the wheel. So they draw a handle.

And this is called a wheel.

Can you see the direction of this wheel here?

As you spin this wheel, you'll see the numbers there go negative and positive.

This is just picking up the names of the numbers that appear there and dropping them into the script here. Now you can steer the car with the steering wheel.

And it's interesting.

You know how kids struggle with variables, but learning in this contextual way ensures that they never forget what variables are and how to use them in this one try.

And we can echo Jillian Ishijima's way here.

So if you look at the little script here, the speed will always be 30.

I will move the car many times accordingly.

And I'm dropping a small dot for each of these. They are evenly spaced because they are 30 apart.

And what if I did this progression, like a 6-year-old did, saying, "Okay, I'll increase the speed by 2 each time and increase the distance by that speed"?

What do you get there? ”

We get a visual pattern of what this nine-year-old calls acceleration.

So how do children do science?

(Video) Teacher: [Select] an object that you think will fall to Earth at the same time.

Student 1: Oh, this is good.

Teacher: Don't worry about what other people are doing.

who has an apple

Alan Kay: They have a little stopwatch.

Student 2: What did you get? What did you get?

AK: Stopwatches are not accurate enough.

Student 3: 0.99 seconds.

Teacher: Then put in a "sponge ball"...

Student 4l: I decided to play shot put and sponge ball. Because they are two very different weights, and they will probably fall at the same speed if dropped at the same time.

Teacher: Please drop it. Class: Oh!

AK: Naturally, Aristotle never asked the child about this particular point. Of course, he didn't bother to experiment, nor did St. Thomas Aquinas.

And just 400 years ago, Galileo really did make adults think like children.

There is one such child in a classroom of 30 children. I'll get to the point really soon.

But what if you want to take a closer look at this?

You can film what's going on, but even if you only stepped through this movie once, it's hard to see what's going on.

So what we can do is lay the frames side by side or stack them on top of each other.

So the children see this and say, "Oh, it's accelerating," remembering when the car was turned sideways four months ago, and began to measure what kind of acceleration it was.

So what I'm doing is measuring from the bottom of one image to the bottom of the next image about a fifth of a second later. And they get faster and faster each time. Stack these up and you'll see the difference. The speed increase is constant.

And they say, "Oh yeah, constant acceleration.

we are already doing that. ”

And how can I check and confirm that I actually have it?

So just dropping the ball there doesn't tell you much, but if you drop the ball and run the movie at the same time, you'll know you came up with an accurate physics model.

By the way, Galileo did this very cleverly by reversing the ball on the strings of his lute.

I took those apples out to convince myself that this is actually probably a Newton and Ringo type of story, but it's a great story.

And to prove that this product works here, I thought I'd do just one thing on this $100 laptop.

Once you gain gravity, increase your speed a bit to speed up your ship.

If you start playing a little game like the kids here, the spaceship will crash.

But if you defy gravity... oops!

(laughs) One more thing.

yes, I'll go. OK?

I think the best way to end this is with two quotes. Marshall McLuhan said, "Children are the message we send to the future." In fact, come to think of it, children are the future we send to the future.

Forget about messages. Children are the future, and first and second world children, especially third world children, need leaders.

And this summer, we'll be making 5 million of these $100 laptops, maybe 50 million next year.

But we couldn't create 1,000 new teachers to save our lives this summer.

That means we can get the technology out there again, but lack the guidance needed to move from a simple new iChat instant messaging system to something deeper.

I think this has to be done with a new kind of user interface, and I think this new kind of user interface can be done for about $100 million in spending.

It sounds like a lot, but it's literally 18 minutes worth of money we spend in Iraq. We spend $8 billion a month. 18 minutes is $100 million. I mean, this is actually cheap.

And Einstein said, "Things should be as simple as possible, but no simpler."

thank you.

Located on an ancient trail on the Monongahela River, Braddock, Pennsylvania is in the eastern region of Allegheny County about nine miles from Pittsburgh.

The industrial suburb of Braddock is home to Andrew Carnegie's first steel mill, the Edgar Thomson Works.

It has been in operation since 1875 and is the last working steel mill in the area.

For 12 years, I have collaborated on portraits, still lifes, landscapes and aerial photography to build a visual archive addressing the intersection of the impacts of the steel industry, the environment and the health system on the bodies of families and communities.

Braddock's traditions and epic stories mostly consist of stories of businessmen and unions.

Now a symbol of Rust Belt revitalization, the new story of Braddock is a story of urban settlers discovering new frontiers.

The mass media ignore the fact that Braddock is majority black.

Our beings have been taken in, silenced and erased.

As a fourth-generation woman, I was raised at 805 Washington Avenue, off Eighth Avenue, under the care and protection of Grandma Ruby.

She worked as Goodwill's manager.

Mom was a nursing assistant.

She watched steel mills shut down and white planes fly over suburban developments.

By the time my generation was walking the streets, deinvestment at the local, state, and federal levels had eroded infrastructure, and the drug war had dismantled my family and community.

Grandma Ruby's stepfather, Gramps, was one of the few black men to retire from the Carnegie factory on a pension.

Working in high temperatures, he demolished and rebuilt furnaces, removing spilled metal and slag.

The history of the place is engraved in the body and scenery.

Areas with heavy truck traffic, exposure to benzene and aerosol metals, risk of cancer and lupus.

123 licensed beds, 652 employees, rehabilitation programs devastated.

A housing discrimination lawsuit against Allegheny County led to the removal of the site where the Talbot Towers project once stood.

Since then, there has been a recent land readjustment aimed at more light industry.

Google Maps and Google Earth pixelation hides the combustible waste used to keep the Vans off their home and land.

In 2013, I chartered a helicopter with cameras to document this active deprivation.

During the flight, my observations revealed thousands of plastic white bundles owned by the conservation industry, which claims to recycle millions of tires to be environmentally friendly, save lives, and improve people's lives.

My work spirals from the micro level to the macro level, uncovering hidden histories.

Isaac Van and I recently had this exhibition at the Seattle Art Museum, which was used as a platform for his voice.

Through the replay of our stories, we continue to fight history erasure and socioeconomic inequality.

thank you.

(applause)

My first prayer was in a glass cathedral.

Long after the congregation had risen, I was on my knees, my hands dipped in holy water, tracing the Trinity on my chest, my little body hanging like a question mark across the wooden banquet hall.

I asked Jesus to fix me, but when He did not answer, I remained silent, hoping that my sin would flare up and the medicine would melt in my mouth like sugar on my tongue, but the shame left an aftertaste.

And in an attempt to bring me back to my sense of sanctity, my mother told me that I was a miracle and that I could be anything I wanted.

I decided to be a boy.

It was cute.

I fought back, put on a toothless grin, used my skinned knees as the city's creed, and played hide-and-seek with the rest of the objective.

I was

A winner in a game that other kids couldn't play, I was an anatomy riddle, a question asked but not answered, walking a tightrope between a clumsy boy and an apologetic girl. And when I turned 12, boyhood was no longer considered cute.

A group of nostalgic aunts who missed my knees hidden in the shadows of my skirts gathered to remind me that I could never bring my husband home with my attitude, that I existed for heterosexual marriage and childbearing.

And I swallowed their insults, including their slander.

Naturally, it did not come out of the closet.

Kids at my school opened it without my permission.

They called me by a name I didn't recognize, called me a lesbian, but I was more of a boy than a girl, more of a Ken than a Barbie.

It had nothing to do with hating my body, I just love it enough to let it go, I treat it like a home, and when your house is crumbling, you don't take shelter, you make your interior comfortable enough to accommodate everything, you clean it enough to invite guests, you make the floorboards strong enough to stand on.

My mother is afraid I named it after something faded.

Counting the echoes left by Maia Hall, Leela Alcorn and Blake Blokington.

She is afraid that I will die without a whisper, that the conversation at the bus stop will turn into "what a pity".

She claims that I turned myself into a mausoleum, that I became a walking coffin, that news headlines turned my identity into a spectacle, summoned Bruce Jenner on everyone's lips, and that the cruelty of living in this body is starred at the bottom of the page of equality.

No one thinks of us as humans because we are more like ghosts than flesh. Because people fear that my gender expression is a trick, that it exists because it is perverted, that it traps people without their consent, that my body is a treat for their eyes and hands, and that once they eat my weird stuff, they will spit out all the parts they didn't like.

They'll put me back in the closet and hang it with the other skeletons.

It will be the best attraction.

See how easy it is to coffin a person or misspell a name on a tombstone?

And people still wonder why boys are rotten, fear they'll walk out of high school hallways, become another hashtag in an instant, fear classroom debates will turn out to be like Judgment Day, and now oncoming traffic is often more accepting of transgender kids than parents.

How long will it be before trance suicide notes start to feel redundant, and before we realize that our bodies become a lesson in sin long before we learn how to love?

Just as God did not save all this breath and mercy, just as my blood is not the wine that washed Jesus' feet.

My prayers are stuck in my throat now.

Maybe I'm finally healed, maybe I just don't care, maybe God finally hears my prayers.

thank you.

(applause)

My story begins in the northern Galapagos Islands, where shoals of sharks exist under 50 feet of water.

I was scuba diving with a group of friends for about a week and it was amazing. We got to see manta rays, whale sharks, penguins and of course hammerhead sharks.

Diving today was especially tricky.

The upheaval was terrible.

While scanning for beautiful pictures, the high waves threw us into the rocks several times, requiring us to keep our camera gear firmly in place and our arms out in front of us.

It was fine until...

not good.

Something was terribly, horribly wrong.

When I pulled my hand back, I saw long, black sea urchin spines all the way through my glove, through my hand.

Well, this is no good.

I mean, when you obviously have something stuck in your hand, it's just awful, but in this case, sea urchins are poisonous, and if you've ever been entangled in a sea urchin, you know that sea urchin spines inside you cause horrible, painful inflammation.

But it wasn't even in my mind at this point.

This didn't seem real.

I couldn't believe it was my hand.

Now, in crisis, I tend to detach like a little scientist and speak very analytically.

With all the analysis gone, the adrenaline kicking into my brain, I just pulled my spine out.

I don't remember doing it.

I remember thinking, 'I can't take my gloves off with this in it.

I remember taking off my gloves and seeing a big black plume appear in front of my face.

And then the biologist's brain appears and begins to panic.

"How did all that toxin get into the wound?"

Well, then the physicist's brain appears and explains very calmly. "No, no, no, we're at 50 feet, so red wavelengths are attenuated.

It's blood, not black.

and a shark.

So what are you going to do? ”

Well, I lowered the cummerbund pretty hard on my hand and I just swam away.

"Let that big cloud of old blood dissipate a little before we push our way through these sharks to the surface."

So when I surfaced, my warm-blooded mammal brain went into a completely nonsensical panic.

All the way up. "

And they didn't.

Apparently they read the same book as me.

(Laughter) Now, when you're stung by a sea urchin spine and you're two days away from getting medical attention, all you have to do is, unfortunately, cook your hands.

So I put it in as hot water as I can bear and keep adding boiling water until I think I'm completely insane.

Well, it worked. The hands themselves didn't work well for a few weeks after that, but eventually fine motor skills returned.

All but one spot remained stiff and sore for several weeks after others had improved.

It turned out that I had broken the tip of the sea urchin's spine at the joint itself, and that was the reason why the condition had not improved.

So the orthopedic surgeon said, 'You know, we need to get this out.

It's not that urgent, it's not an emergency. ”

So I scheduled a minor surgery for several weeks on Monday.

And last Friday, I broke my pelvis in a horse riding accident.

(Laughter) Right.

So we postponed the operation.

I broke my pelvis and ended up spending six weeks on the couch. If it weren't for my friends, I would be completely insane.

Spontaneous parties erupted in my house every night for weeks.

I was fed. it was fun.

good.

However, maintaining that kind of enthusiasm in the long run was a little more difficult, and I ended up with just one friend who would joke around during the day and hang out at night. During this convalescence, I got along better with the friend.

And when we were finally strong enough to put on weight and exercise, we loaded the telescope into the car and headed up the mountain to observe Comet Hale-Bopp.

Yes we are geeks.

and got caught in a landslide.

(Laughter) I know -- right?

No, just kidding.

(Laughter) No more disasters. No, it's actually the other way around.

That was 21 years ago, and for 19 of those years, I've been married to a wonderful introvert who wouldn't have approached me in a million years under other circumstances.

We have a lovely 14 year old daughter who did all the illustrations.

(Cheers and applause) Yes.

So, Pro Tip: Apparently, nothing makes you sexier than needing a walker on a first date.

So this is not about piercings and sharks, sores and broken bones.

It's a love story.

It's a love story with a funny little epilogue.

Now that I'm bearing weight again, I was able to reschedule the surgery and have my spine removed.

But I didn't need that anymore.

It turns out that when you break a bone, your body recovers calcium from every bone in your body, and even from the spine of a tiny sea urchin that happened to get stuck in your knuckle.

Yes, my pelvis became part of the sea urchin.

(Laughter) So you have a biologist's brain, a physicist's brain, an adrenaline brain, a warm-blooded mammalian brain, plus a "sea urchin brain" with all the superpowers that it brings.

But don't worry. One of the things my family loves most about me is that I'm not a perfect human being.

(laughs) Thank you very much.

(applause)

This summer, I was back in Ohio for a family wedding and had a meet and greet with Anna and Elsa from Frozen.

This is not a Disney-sanctioned event, so it's not Anna and Elsa from Frozen.

These two entrepreneurs were in the business of running princess parties.

Is your child already 5 years old?

They'll come sing songs and sprinkle fairy dust, that's great.

And they weren't going to pass up the chance that this phenomenon was Frozen.

So the kids are hired by the local toy store, come in on Saturday mornings, buy some Disney stuff, have their picture taken with the princesses, and that's it.

It's like Santa Claus without seasonal restrictions.

(Laughter.) And my three-and-a-half-year-old niece Samantha was in the middle of it.

She didn't mind that the two women were signing posters and coloring books with one of the "N's" as The Snow Queen and Princess Anna to avoid copyright lawsuits.

(Laughter) According to my niece and over 200 kids in the parking lot that day, it was Anna and Elsa from Frozen.

A scorching Saturday morning in August in Ohio.

We arrived at 10am, the scheduled start time, and were given number 59.

By 11 o'clock they had called numbers 21 to 25. This will take some time, and no amount of free face painting or temporary tattoos will prevent the chaos that has occurred outside the store.

(Laughs) So, I was called by 12:30, 'I'd like numbers 56 to 63, please.'

And when we're inside, it's a sight you can only describe as Norway looking like it's vomiting.

(Laughter) There were cardboard snowflakes covering the floor, glitter on every flat surface, and icicles all over the walls.

And as we stood in line to give my niece a better place than her mother's back at number 58, I put her on my shoulders and she was instantly glued to the sight of the princesses.

And as we moved forward, her excitement grew even more, and when I finally got to the front of the line and Number 58 unfurled the poster for the princesses to sign, I could literally feel the excitement running through her body.

To be honest, I was pretty excited at that point too.

(Laughter) So Scandinavian decadence was mesmerizing.

(Laughter) So when we got to the front of the line, the gaunt clerk said to my niece, "Hello Honey. You're next!"

Do you want to get off or do you want to sit on Dad's shoulders and take a picture? (laughter) And I froze, for no other suitable word.

(Laughter) It's amazing to be confronted with the question of who we are in unexpected moments.

am i your aunt? Or am I an advocate?

Millions of people have seen my videos on how to have difficult conversations, and the videos were right there in front of me.

At the same time, nothing in my life is more important than my children. So we found ourselves in a situation we often encounter: torn between two things, two impossible choices.

Can I be an Advocate?

Shall I take my niece off my shoulder and turn to the clerk and explain that I'm actually her aunt, not her father, and that I should be more careful not to jump to gender conclusions just by cutting my hair or putting it on my shoulder? In doing so, would I miss what was, at this point, the greatest moment of my niece's life?

Or will I become an aunt?

Would I ignore that comment, take a million photos, not be distracted for a moment from the sheer joy of the moment, and walk away with the shame that comes from not standing up for myself in doing so, especially in front of my niece?

Who was I?

Which was more important? Which role was more deserving?

Was I your aunt? Or was I an advocate?

And I had a split second decision.

We are now taught that we live in a world of ever-increasing polarity.

It's black and white, so us and them, right and wrong.

No middle ground, no gray, just polar.

Polarity is the state in which two thoughts or opinions are completely opposite to each other. Quite the opposite.

which side are you on?

Are you clearly and unquestionably anti-war, pro-choice, anti-death penalty, gun control, open borders, trade unions?

Or do you believe that the absolute, uncompromising pro-war, anti-life, pro-death penalty, 2nd Amendment is absolute, anti-immigrant, pro-business?

It's all or nothing, you agree or disagree with us.

That's the polarity.

The problem with polarity and absoluteness is that it eliminates the individuality of our human experience, which contradicts human nature.

But if we are being pulled in these two directions, but if that is not where we really are—if polarity is not our actual reality—where do we go from there?

What's at the other end of that spectrum?

I don't think it's an unattainable harmonious utopia. I think the opposite of polarity is duality.

Duality is the state in which two parts exist simultaneously, rather than being diametrically opposed.

Do you think it is possible?

People I know are: I know Catholics who support choice, feminists who wear hijabs, veterans who advocate against war, and NRA members who think I should be able to marry.

That's the people I know, that's my friends and family, that's the big part of our society, that's you, that's who I am.

(Applause) Duality is the ability to hold both things.

But the question is, can we own our duality?

Can we have the courage to keep both?

I work at a restaurant in town, and I became very good friends with that busser.

I was the server and we had a great relationship and had a really great time together.

She was from Mexico so she spoke good Spanish.

(Laughter.) That line was actually the other way around.

Her English was limited but much better than my Spanish.

But rather than being separated by our differences, we were united by our similarities.

And even though we came from completely different worlds, we were close.

She is from Mexico and left her family to come here so she could have a better life in her hometown.

She was a devout conservative Catholic who believed in traditional family values, the archetypal roles of men and women, and so was I.

(Laughter.) But what really bonded us was when she asked about my girlfriend and shared a photo I got from my family back home.

They were what brought us together.

Then one day, as we cut down food as fast as we could in the back, and gathered around a small table in one of those rare lulls, a new man came in from the kitchen, who happened to be her cousin--and sat down displaying all the bravado and manliness his twenty-year-old body could possess.

(Laughter) And he said to her [in Spanish], 'Does Ash have a boyfriend?

And she said [in Spanish] "No, she has a girlfriend."

And he said [in Spanish] "Girlfriend?!?"

And she put down her fork, made eye contact with him, and said [in Spanish], "Yes, girlfriend. That's it."

And his smug smile quickly turned into a sign of respect for his mother, grabbing a plate and walking away to get back to work.

She never made eye contact with me.

She walked away and did the same. It was a 10 second conversation, a very short exchange.

And while on paper she had so much in common with him—language, culture, history, family—community was her lifeblood here, her moral compass trumps them all.

And a little later they were joking in Spanish in the kitchen, which had nothing to do with me, that's the duality.

She didn't have to choose a PC. stance on homosexuality over her tradition.

She didn't have to choose family over our friendship.

It wasn't Jesus or Ash.

(Laughter) (Applause) Her personal morality was so entrenched that she had the courage to defend both things.

Our moral integrity is our responsibility and we must be prepared to defend it even when it is inconvenient.

That's what it means to be an ally, and if you want to be an ally, you have to be an active ally. Ask questions, act when you hear something inappropriate, and get really involved.

I had a family friend who called her sweetheart for many years.

TRUE? mistress?

Too sexual, 70's gay porn.

(Laughter.) But she was trying and asked.

She could have called her my friend, or my "friend," or my "special friend" -- (laughter) -- or worse, just not asked at all.

Believe me, I would rather you listen.

I think it's better to have someone say you're my lover than not to say anything.

People often say to me, 'Well, Ash, I don't care.

I see no race, no religion, no sexuality.

It doesn't matter to me. I can not see. ”

But I think the opposite of homophobia, racism and xenophobia is indifference, not love.

If you don't understand my homosexuality, you don't understand me either.

If it doesn't matter to you who I sleep with, you can't imagine how I feel when I'm walking down the street late at night holding her hand and I have to approach a group of people and have to make a decision if I should hold onto that hand or drop it when I just want to hold it tighter.

And the little triumphs you feel when you make it through and don't have to let go.

And the incredible meanness and disappointment you feel when you drop it.

If you can't see that conflict inherent in my human experience because I'm gay, then you can't see me.

If you want to be an ally, I want you to meet me.

As individuals, as allies, as human beings, we need to be able to hold both the good and the bad, the easy and the hard.

You don't learn how to hold two things from mere fluff, you learn from your gut.

And what if duality is only the first step?

What if we could learn to value two things through compassion, empathy, and human interaction?

And if you can hold two things, you can hold four, if you can hold four, you can hold eight, if you can hold eight, you can hold hundreds.

We are complex individuals, swirling with contradictions.

You have a lot on your mind right now.

How can I keep it for just a little longer?

Now back to Toledo, Ohio.

I'm at the front of the line, my niece on my shoulders, and the exhausted clerk calls me Dad.

Have you ever been mistaken for your gender?

Not even that.

Have you ever been called something you weren't?

To me it feels like I'm like a storm of contrasting emotions in an instant.

I was sweating a mixture of anger and humiliation, and it felt like the whole store was staring at me, and I was invisible at the same time.

I want to explode in a storm of rage, I want to crawl under a rock.

Add to that the frustration that my breasts are going to be visible throughout this store because I'm out of character and wearing a tight fitting purple t-shirt so this exact same thing doesn't happen.

(Laughter.) But despite my best efforts to be seen as my true gender, it still happens.

And I hope with all my heart that no one will hear me—not my sister, not my girlfriend, and of course my niece.

I am used to this familiar wound, but I will do whatever it takes to protect my loved ones from it.

But then when I get my niece off my shoulders, she runs over to Elsa and Anna. It's what she's been waiting for. And then everything fades away.

All that matters is the smile on her face.

Then, when the 30 seconds of our two-and-a-half hour wait came to an end, we packed up and made eye contact with the clerk again. She then gave me an apologetic smile and said, "Sorry!"

(Laughter.) And I immediately felt uneasy about her humanity, her willingness to admit her mistakes. And I said to her, "It's okay, it happens. But thank you."

And in that moment I realized I didn't have to be either an aunt or an advocate, I could be both.

I can live in duality, I can hold two things.

And if you can keep two things in that environment, you'll be able to keep more.

As she and my niece ran out the door holding hands, I turned to my sister and said, "Was it worth it?"

And she said, "Are you kidding me?

Did you see the look on her face? Today was the best day of her life! ”

(Laughter) "Well worth the two and a half hours in the heat, and well worth the expensive coloring book I already had."

(Laughter) "It was worth being called dad."

(Laughter.) And for the first time in my life, it actually did.

Thank you Boulder. have a good night.

(applause)

Purdue University evolutionary biologist William Muir studied chickens.

He was curious about productivity, which I think is relevant to all of us, but with chickens it's easy to measure because you just count the number of eggs.

(Laughter) He wanted to know how we could make chickens more productive, so he devised a great experiment.

Since chickens live in groups, we first selected only the average group and left it alone for six generations.

But then he created a second group of individually most productive chickens, which we could call superchickens. We then grouped them into superflocks, selecting only the most productive chickens for breeding each generation.

After six generations, what did he find?

Well, the first group, the average group, did well.

They were all plump and had a dramatic increase in egg production.

What about the second group?

Well, all but three died.

They pecked and killed the rest.

(Laughter) Individually productive chickens only succeeded by suppressing the productivity of the rest of the chickens.

Now, when I go around the world about this and tell this story to all sorts of organizations and companies, people almost instantly see the relevance and come up to me and say things like, 'That supergroup, that's my company.'

(Laughter) Or, "That's my country."

Or, "That's my life."

I've been told all my life that the way to get ahead is to be competitive - get into the right school, get the right job, be at the top, but I've never found it very exciting.

I started and ran my business because invention is a joy and working with talented and creative people is a reward in itself.

And I've never felt so motivated by orders and super chickens and super stars.

But for the past 50 years, we've run most organizations and some societies around a superchicken model.

We used to think that success was achieved by picking the superstars, the brightest men, or in some cases women, and giving them all the resources and all the power.

And the result was exactly the same as William Muir's experiment: aggression, dysfunction, and waste.

If the only way the most productive people succeed is to stifle the productivity of the rest, we need to find better ways to work and better ways to live.

(Applause.) So why are some groups significantly more successful and productive than others?

Well, that's the problem the team at MIT investigated.

They brought in hundreds of volunteers, divided them into groups, and gave them very difficult problems to solve.

And what happened is, you guessed it, some groups were much more successful than others, but what's really interesting is that the high performers weren't just one or two people with surprisingly high I.Qs.

Nor was the most successful group the group with the highest total I.Q.

Instead, really successful teams had three characteristics.

First of all, they showed a high degree of social sensitivity towards each other.

This is measured by something called the "Reading the Mind in the Eyes" test.

It's widely considered a test of empathy, and the group that scored higher on the test performed better.

Secondly, the successful groups gave each other about the same amount of time, so neither opinion prevailed and there were no passengers.

And third, the more successful groups included more women.

(Applause.) Now, does this mean that women generally scored higher on the "mind-reading" test, thus doubling their empathy scores?

Or is it because it brings more diverse perspectives?

We don't really know, but what's amazing about this experiment is that it shows what we know some groups are doing better than others. But the key is the social connection between groups.

So how does this play out in the real world?

It means that what happens between people really matters. Because in groups that are highly attuned and sensitive to each other, ideas can flow and grow.

People don't get stuck. They don't waste energy on dead ends.

Example: Arup, one of the world's most successful engineering companies, was commissioned to build the equestrian center for the Beijing Olympics.

Now, the building had to accommodate 25,000 very strong Thoroughbred horses, who had arrived from a long flight with severe jet lag and poor physical condition.

And the problem the engineers faced was how much waste to deal with.

Now, this isn't taught in engineering school -- (laughter) -- and it's not really the kind of thing you don't want to be wrong, so he could have spent months talking to veterinarians, doing research, and tweaking spreadsheets.

Instead, he sought help and found the man who designed the Jockey Club in New York.

The issue was resolved within a day.

Arup believes that a culture of helpfulness is central to success.

Now, useful sounds really poor, but this is absolutely core to a successful team and always outweighs the individual's intelligence.

Helpful means I don't have to know everything, just work with people who are good at getting and giving help.

At SAP, we believe we can answer any question in 17 minutes or less.

But in all the tech companies I've worked for, no one has even for a moment imagined that this was a technology problem. Because what promotes usefulness is getting people to know each other.

It sounds so obvious and we think it's going to happen all the time, but it really isn't.

When we first ran our software company, we found ourselves stuck.

There was a lot of friction, but not much else, and I gradually realized that the brilliant, creative people I hired didn't know each other.

They were so focused on their personal work that they didn't even know who was sitting next to them. We only gained real momentum when I insisted on quitting my job and investing time in getting to know each other.

That was 20 years ago, and now I'm visiting a company that bans coffee cups at desks because employees want to hang out around the coffee machine and talk to each other.

The Swedes even have a special term for this.

They call it Fika, which means more than just a coffee break.

It means collective recovery.

Idexx, a company in Maine, created a vegetable garden on campus to help people from different departments of the business collaborate and learn about the business as a whole.

Have they all gone mad?

Quite the opposite. They understand that when things get tough it's always going to be difficult if you're doing really important breakthrough work, that what people need is social support and they need to know who to ask for help.

Companies don't have ideas. Only humans do.

And what drives people is the bond, loyalty and trust they develop between each other.

It's not just the bricks that matter, it's the mortar.

Combine all of this and you have what is called social capital.

Social capital is the dependencies and interdependencies that build trust.

The term comes from sociologists who studied communities that proved to be particularly resilient during times of stress.

Social capital is what gives a company momentum, social capital is what makes a company strong.

What does this mean in practical terms?

Social capital grows over time, which means time is everything.

Teams that work together longer are better because it takes time to build the trust needed for true candor and openness.

And time creates value.

Alex Pentland recommended a company to synchronize coffee breaks so employees had time to talk to each other, resulting in a $15 million increase in profits and a 10% increase in employee satisfaction.

The return on social capital isn't bad and increases as you spend it.

Now, this is no fancy talk, nor is it a lazy charter. Because people who work this way tend to be kind of hurtful, impatient, and absolutely determined to think for themselves. Because that is their contribution.

Conflicts often arise because frankness is safe.

No idea is ever fully formed, so good ideas turn into great ideas.

It emerges little by little with the birth of a child and is a bit messy and confusing, but full of possibilities.

And only through generous contributions, convictions, and challenges do they reach their potential.

And social capital supports it.

Now, we are not very used to talking about talent and creativity in this way.

We are used to talking about stars.

So I started to think that if I started working this way, the stars would be gone.

So I auditioned for the Royal Academy of Dramatic Art in London.

What I saw there really amazed me. Because the teachers weren't looking for individual pyrotechnicians.

They were looking for what happened among the students. Because there is drama.

And when I spoke with the producers of the hit albums, they said, ``There are certainly a lot of superstars in the music world.

But they don't last very long.

It's the best collaborators who enjoy long careers, because bringing out the best in others is how they find the best in themselves. ”

And when we visited companies renowned for their ingenuity and creativity, we didn't even see the superstars. Because everyone there really mattered.

And when I look back on my own career and the amazing people I've had the chance to work with, I realize how much more we can give to each other if we stop trying to be super chickens.

(Laughter) (Applause) If we truly understand what social work is, many things have to change.

Under management based on talent contests, employees regularly competed with each other.

Now competition must be replaced by social capital.

For decades, we've been trying to move people with money, even though there's tons of research showing that money erodes social connections.

Now we need people to inspire each other.

And for years we have thought of leaders as heroic soloists, expected to solve complex problems single-handedly.

Now we need to redefine leadership as the activity of creating the conditions in which everyone can think together in their most courageous way.

I know this works.

When the Montreal Protocol called for phasing out CFCs, chlorofluorocarbons linked to holes in the ozone layer, the risks were immense.

CFCs were everywhere and no one knew if replacements could be found.

But one team that rose to the challenge adopted three key principles.

First, engineering chief Frank Maslen said, "There will be no stars on this team."

we need all of them.

Everyone has a valid point of view.

Second, we work by only one standard: the best possible standard.

And third, he told his boss, Jeff Tadhope, that he had to be patient because he knew how big a destructive force could be.

Now, this doesn't mean Tudhope didn't do anything.

He gave the team air cover and listened to make sure the team adhered to the principles.

And it worked. The group was the first to solve this problem, ahead of other companies tackling this difficult problem.

And to date, the Montreal Protocol is the most successful international environmental agreement ever implemented.

There were many crises looming then, and many looming crises today. Problems are not solved by expecting a few Supermen or Superwomen to solve them.

We need you all now. Because only when we accept that everyone has value is the energy, imagination and momentum necessary to create the immeasurable best possible.

thank you.

(applause)

I am a failed woman and a failed feminist.

I am passionate about gender equality, but I fear that it is not fair to good feminists to freely embrace the label "feminist."

I'm a feminist, but I'm a pretty bad feminist.

Oh, that's why I call myself a bad feminist.

At least I wrote an essay, then a book called "Bad Feminist," and then people started calling me a bad feminist in interviews.

(Laughter) So what started as a bit of an inside joke and a deliberate provocation to myself became a reality.

Let's take a step back.

When I was younger, mostly in my teens and twenties, I had a weird idea of ​​feminists, as if they were hairy, wry, man-hating, sex-hating women, as if that was a bad thing.

(Laughter) I see how women are treated all over the world these days, and anger in particular seems like a perfectly reasonable response.

But at the time, I was concerned about the tone people used to suggest that I was a feminist.

The feminist label was a stigma, an 'F' word, not a good word.

By daring to believe I was equal—(coughing)—better than men, I was labeled a woman who doesn't follow the rules, expects too much, thinks too highly of herself.

You don't want to be that rebellious woman until you realize you can't imagine yourself being that woman and being anyone else.

As I've gotten older, I've certainly come to accept that I'm a feminist and a proud feminist.

I consider certain truths to be self-evident. That is, women are equal to men.

We have the right to pay equal wages for equal work.

We have the right to move around the world as we choose, free from harassment and violence.

We have the right to easy and affordable access to contraceptive and reproductive services.

We have the right to make choices about our bodies, free from legislative oversight and evangelical dogma.

We have a right to be respected.

We have others, too.

When we talk about women's needs, we need to consider other identities that we live in.

We are not just women.

We are people of different bodies, gender expressions, beliefs, sexualities, class backgrounds, abilities, and more.

We need to consider these differences and how they affect us as much as we consider our commonalities.

Without this kind of inclusion, our feminism is nothing.

I think these truths are self-evident, but let me be clear, I'm screwed.

I am full of contradictions.

There are many things I do wrong about feminism.

I have another confession to make.

As I drive to work, I listen to vicious rap at very high volumes.

(laughter) Even though the lyrics demean women, this lyric is deeply offensive to me. The classic Yin-Yang Twins song "Salt Shakers" is great.

(Laughs) "A wet T-shirt is fine.

Bitch, you gotta shake your camel until it starts hurting! ”

(Laughter) Think about it.

(Laughter) Poetry, right?

I completely regret my music choices.

(Laughter) I'm a strong believer in the importance of human work. That's something I don't want to do. This includes not only general household chores, but also insect control, trash removal, lawn care, and car maintenance.

I don't want to get involved in any of that.

(laughs) Pink is my favorite color.

I like fashion magazines and cute things.

I watch "The Bachelor" and romantic comedies and have absurd fantasies of fairy tales coming to life.

Some of my sins are more flagrant.

If a woman wants to take her husband's name, that's her choice, not mine.

If women choose to stay home to raise their children, I am open to that choice.

The problem isn't that the choice makes her financially vulnerable. The problem is that our society is set up so that women are economically vulnerable when they choose to.

Let's deal with it.

(Applause.) I stand in support of white, middle-class, and upper-class heterosexual women and reject mainstream feminism that has historically ignored or diverted the needs of women of color, working-class women, queer women, and transgender women.

If that's good feminism, listen. I'm such a bad feminist.

(Laughter) There is also this. As a feminist, I feel a lot of pressure.

We tend to put visible feminists on a pedestal.

We expect them to pose perfectly.

When they let us down, we gleefully knock them off the pedestal that put them on.

Like I said earlier, I'm a mess. Consider me knocked off the pedestal before you try to make me stand there.

(Laughter.) Too many women, especially breakthrough women and industry leaders, fear being labeled as feminists.

They are afraid to stand up and say, “Yes, I am a feminist,” for fear of not meeting unrealistic expectations of what that label means.

Take Beyoncé, or as I call her a goddess, for example.

(Laughter.) She's emerged as a visible feminist in recent years.

At the 2014 MTV Video Music Awards, she performed in front of the word "feminist" ten feet tall.

It was a glorious sight to see the pop star openly embrace feminism and let young women and men know that being a feminist is something to be celebrated.

As the moment faded away, cultural critics began to endlessly debate whether Beyoncé was really a feminist.

Rather than just take the grown and experienced woman's word for it, they appreciated her feminism.

(Laughter) (Applause) We expect feminists to be perfect. Because we are still fighting for so many things, wanting so many things, and needing so many things.

We go far beyond reasonable and constructive criticism to dissect and tear apart a particular female feminism until nothing remains.

You don't have to.

Bad feminism, or actually more inclusive feminism, is the starting point.

But what happens next?

From acknowledging our imperfections, we move from taking responsibility to taking our own steps and acting with a little more courage.

When I listen to poor quality music, it creates a demand that artists are willing to supply in unlimited quantities.

These artists aren't going to change how they talk about women in their songs until we impact our bottom line and demand changes.

Indeed, it is difficult.

Why does it have to be so catchy?

(Laughter) It's hard to make better choices, but it's so easy to justify worse choices.

But when I justify wrong choices, it makes it harder for women to achieve equality, the equality we all deserve. i need to make it mine.

It reminds me of my 3 and 4 year old nieces.

They are gorgeous, stubborn, smart and very brave girls.

I want them to thrive in a world where they are valued for their mighty creatures.

Thinking about them suddenly makes it much easier to make better choices.

We can all make better choices.

If a TV show deals with sexual violence against women like sports or Game of Thrones, we can change the channel.

Hearing a song that disrespects women can change radio stations.

If movies don't treat women as more than ornaments, we can spend our box office money elsewhere.

We can stop supporting professional sports where athletes treat their partners like punching bags.

(Applause.) Alternatively, men, especially heterosexual white men, can say, "No, I won't publish in your magazines, participate in your projects, or otherwise work with you until you have a significant number of women as participants and decision makers."

I will not work with you until your publication, or your organization, is more embracing all sorts of differences. ”

Those of us who are underrepresented and invited to participate in such projects can also decline until more people are invited through the glass ceiling and they are no longer just tokens.

Without these efforts, without these positions, our achievements would mean little.

We hope that we can take these small acts of courage, and that our choices will trickle down to editors, film and music producers, CEOs, lawmakers and others in power, to those who can make bigger and bolder choices to create lasting and meaningful change.

We can boldly advocate good feminism, bad feminism, or anything in between.

The last line of my book, Bad Feminist, says, "I'd rather be a bad feminist than not."

There are many reasons for this, but first and foremost I am saying this because my voice was once taken away and feminism helped me regain it.

There was an incident.

I call it an incident because it carries the burden of what happened.

When I was younger, I had no idea what boys could do to break girls.

They treated me like nobody.

I began to believe that I was nothing.

They stole my voice and after that I stopped believing that what I said mattered.

But--I had the text.

So I put together and wrote myself.

I wrote myself towards a stronger version of myself.

I read the words of women who might understand my story, and women who were like me, and understood what it was like to live in the world with brown skin.

I have read the words of these women and they have taught me that I am nothing.

I learned to write like them and then like myself.

I found my voice again and began to believe that my voice was immeasurably powerful.

Through writing and feminism, I also realized that if I had a little courage, other women might hear my voice and look at me and realize that none of us are anything like the world is trying to tell us.

One hand has the power to accomplish anything.

And the other side has the humble reality of being just one woman.

I'm a bad feminist, but I'm a good woman. I strive to be better in how I think, say, and act without giving up everything that makes me human.

I hope we can do the same.

I hope we can all find a little bit of courage when we need it most.

(applause)

A few years ago, my mother developed rheumatoid arthritis.

Her wrists, knees, and toes were swollen, causing severe, chronic pain.

She had to apply for disability.

She stopped attending the local mosque.

One morning she was in so much pain that she could not brush her teeth.

I wanted to help.

But I didn't know how to do that.

i am not a doctor

So, I am a historian of medicine.

So I started researching the history of chronic pain.

After all, UCLA's archives preserve the entire history of collecting pain.

And I found a story, a wonderful story, of a man who saved millions of people from suffering. people like my mother.

Still, I had never heard of him.

There was neither his biography nor Hollywood films.

His name was John J. Bonica.

But when our story began, he was better known as Johnny "Bull" Walker.

It was a summer day in 1941.

The circus had just arrived in the small town of Brookfield, New York.

Audiences flocked to see wirewalkers, vagrant clowns, and, if they were lucky, human cannonballs.

They also came to meet Johnny "Bull" Walker, the brawny bully, brawny guy who will pin you for a dollar.

As you know, voices echoed through the circus PA that day. system.

They urgently needed a doctor in the live animal tent.

Something went wrong with the Lion Tamer.

The climax of his act failed, his head stuck inside the lion's mouth.

He was running out of air. The crowd watched in horror as he struggled and passed out.

When the Lion finally loosened its jaws, the Lion Tamer fell to the ground, motionless.

A few minutes later, when he awoke, he saw a familiar figure crouching over him.

It was a Bull Walker.

The powerful man gave the lion tamer a mouth-to-mouth sentence and saved his life.

Well, I didn't tell anyone about the strong man, but he was actually a third-year medical student.

During the summer he toured with a circus to pay for his tuition, but kept it a secret to protect his personality.

He was supposed to be a savage villain, not a geeky good-doer.

His medical colleagues didn't know his secret either.

In his words, "If you were an athlete, you would be a stupid dodo."

So he didn't talk about the circus or how he wrestled professionally at night and on weekends.

He used pseudonyms like Bull Walker, or later Masked Marvel.

He kept it a secret when he became world light heavyweight champion that same year.

Over the years, John J. Bonica lived these parallel lives.

he was a wrestler. he was a doctor

he was a heel he was a hero

He inflicted pain and healed it.

He didn't know it at the time, but over the next 50 years, he would use these conflicting identities to establish an entirely new way of thinking about pain.

It would change modern medicine so much that decades later Time magazine would call him the originator of painkillers.

But it all happened later.

In 1942, Bonica graduated from medical school and married Emma, ​​the sweetheart she had met years earlier at a game.

He was still wrestling in secret – he had to.

An internship at St. Vincent's Hospital in New York yielded no results.

With a championship belt in his hand, he wrestled strong opponents like Everett "The Blonde Bear" Marshall and three-time world champion Angelo Savoldi at big-ticket venues like Madison Square Garden.

The match did great damage to his body. He tore his hip and broke his ribs.

One night, Terrible Turk's thumb left a Capone-like scar on the side of his face.

The next morning at work he had to wear a surgical mask to cover it up.

Bonica appeared twice in the operating room. One eye was so badly damaged that he could not see out.

But the worst of all was his severed cauliflower ear.

He said it felt like two baseballs on the side of his head.

His life was filled with pain.

Next, he watched his wife go into labor at the hospital.

She shook and pushed, clearly in pain.

Her obstetrician called on the resident on duty to give her a few drops of ether to ease the pain.

However, the intern was a young man who had only been with the company for three weeks. He was nervous and irritated Emma's throat as he applied the ether.

She vomited and choked and started turning blue.

Bonica, who saw all this, pushed the intern out of the way, cleared his airway, and saved his wife and unborn daughter.

At that moment, he decided to dedicate his life to anesthesiology.

He then became involved in the development of epidural analgesia for birth mothers.

But Bonica needed basic training before she could focus on obstetrics.

Just around D-Day, Bonica turned up at the Madigan Army Medical Center near Tacoma.

The 7,700-bed hospital was one of the largest military hospitals in the United States.

Bonica was in charge of all pain control there.

he was only 27 years old.

After treating so many patients, Bonica began noticing cases that contradicted everything she had learned.

The pain, in a good way, was supposed to be a kind of wake-up call from your body telling you of an injury like a broken arm.

However, in some cases, such as after the patient has had a leg amputated, the patient may complain of pain in a leg that does not yet exist.

But if the injury had been treated, why did the alarm bells keep ringing?

In other cases, patients were still in pain even though there was no evidence of injury.

Bonica tracked down all the specialists at his hospital, including surgeons, neurologists and psychiatrists.

And he tried to hear their opinion about the patients.

It was taking too long, so he started organizing group meetings over lunch.

It's like a tag-team of specialists facing a patient's pain.

No one has ever focused on pain like this before.

After that he published a book.

He read every medical textbook available and carefully noted every mention of the word "pain."

Of the 14,000 pages he read, the word "pain" was found on 17.5 pages.

seventeen and a half.

About the most basic, most common, most frustrating part of being a patient.

Bonica was shocked--to quote him, he said, "What conclusions can you draw?

Most importantly from the patient's point of view, they don't talk. ”

So for the next eight years, Bonica would talk about it.

he will write about it He will write the missing pages.

He wrote what would later become known as the Bible of Pain.

In it, he proposed a new strategy, a new treatment using nerve block injections.

Based on that lunchtime meeting, he proposed a new facility called a pain clinic.

But the most important thing about his book is that it was something of an emotional wake-up call to medicine.

A desperate plea to doctors to take pain in their patients' lives seriously.

He reconsidered the very purpose of medicine.

The goal is not to make the patient better. It was to make the patient feel better.

He pushed his pain tackling for decades until it finally took hold in the mid-70s.

Hundreds of pain clinics have sprung up around the world.

But as they did, a tragic turn of events occurred.

Bonica's years of wrestling caught up with him.

Although he has been out of the ring for over 20 years, 1,500 professional matches have left a mark on his body.

He was in his mid-50s and had severe osteoarthritis.

Over the next 20 years, he will have 22 surgeries, including four spinal surgeries and a hip replacement followed by a hip replacement.

He could barely lift his arm or turn his neck.

He needed aluminum crutches to walk.

His friends and former students became his doctors.

One recalled having had more nerve block injections than perhaps anyone else on the planet.

Originally a workaholic, he worked even harder, working 15 to 18 hours a day.

Healing others became not just a job, but the most effective form of relief for himself.

"If I wasn't as busy as I am now, I would be completely disabled," he told reporters at the time.

During a business trip to Florida in the early 1980s, Bonica had a former student drive her to the Hyde Park area of ​​Tampa.

They drove past palm trees and parked at an old mansion with a huge silver howitzer hidden in the garage.

The house belonged to the Zacchini family, like the circus royal family of America.

Decades ago, Bonica watched them in silver jumpsuits and goggles perform the act that pioneered them: Human Cannonball.

But now they, like him, have retired.

That generation is long gone, including Bonica, so we have no way of knowing exactly what they said that day.

Still, I love to imagine it.

The strong and the human cannonball reunited, showing old wounds and new wounds.

Perhaps Bonica gave them medical advice.

Perhaps he told them what he later told in his oral history: how his time in the circus and wrestling had shaped his life so deeply.

Bonica saw the pain up close.

he felt it. he lived it

And it made it impossible for him to ignore others.

Out of that empathy, he spawned a whole new field and played a major role in making medicine recognize pain itself.

In the same oral history, Bonica argued that pain is the most complex human experience.

It has to do with your past lives, your present life, your interactions, your family.

That was definitely the case with Bonica.

But it was also true of my mother.

Doctors tend to think of my mother as a kind of professional patient, a woman who just spends her days in the waiting room.

Sometimes I end up looking at her the same way.

But as I watched Bonica's pain, it was a testament to his life to the fullest, I began to remember all that my mother's pain was holding.

Before swollen and arthritic, my mother's fingers rattled in the HR department of the hospital where she worked.

They folded samosas for our entire mosque.

When I was a kid, they cut my hair, wiped my nose, and tied my shoelaces.

thank you.

(applause)

Just after Christmas last year, 132 children in California contracted measles after visiting Disneyland or coming in contact with someone who was there.

The virus then jumped across the Canadian border and infected more than 100 children in Quebec.

One of the tragic things about this epidemic is that measles can be fatal for children with weakened immune systems and is one of the most easily preventable diseases in the world.

Although an effective vaccine against the disease has been available for more than half a century, many of the children involved in the Disneyland outbreak were not vaccinated because their parents feared a much worse disease, autism.

But wait a minute. Hasn't the controversial paper on autism and vaccines been debunked, retracted, and branded as a deliberate fraud by the British Journal of Medicine?

Don't most science-savvy people know that the theory that vaccines cause autism is B.S.?

Like most of you, millions of parents around the world continue to worry that vaccines will put their children at risk for autism.

why?

Here's why.

Here is a graph of autism prevalence estimates rising over time.

For most of the 20th century, autism was thought to be an incredibly rare condition.

Several psychologists and pediatricians who have even heard of the disease thought they would go through life without seeing a single case.

For decades, prevalence estimates have remained stable at only 3–4 children per 10,000.

But in the 1990s, that number began to skyrocket.

Fundraising groups like Autism Speaks regularly refer to autism as an epidemic, as if you caught it from another child at Disneyland.

what happened?

What if not a vaccine?

When you ask officials at the Centers for Disease Control in Atlanta what's going on, they tend to rely on phrases like "expanding diagnostic criteria" and "improving case finding" to explain the rise in these numbers.

But such words don't do much to assuage the fear of a young mother looking for face-to-eye contact with her 2-year-old.

If the diagnostic criteria need to be broadened, why were they so narrow in the first place?

Why was it so difficult to find cases of autism before the 1990s?

Five years ago, I decided to clarify the answers to these questions.

I learned that what happened had less to do with the slow, cautious progress of science than with the captivating power of storytelling.

For most of the 20th century, clinicians told a story about what autism was and how it was discovered, but that story turned out to be false, and the consequences have had a devastating impact on global public health.

There was a more accurate second story about autism that was buried in obscure corners of the clinical literature and forgotten.

This second story tells all about how we got here and where we need to go next.

The first story begins with Leo Kanner, a child psychiatrist at Johns Hopkins Hospital.

In 1943, Kanner published a paper describing 11 young patients who seemed to live in a private world, ignoring the people around them and even their own parents.

They could enjoy themselves for hours by flapping their hands in front of their faces, but little things, like a favorite toy being unknowingly moved from its usual place, would cause them to panic.

Kanner surmised that autism was extremely rare based on the conditions of the patients brought to the clinic.

By the 1950s, as the world's foremost authority on the subject, he claimed to have had less than 150 actual cases of his syndrome, despite referrals from as far away as South Africa.

This is not really surprising, as Kanner's diagnostic criteria for autism were incredibly selective.

For example, he did not recommend making a diagnosis in children who had seizures, but we now know that epilepsy is very common in autism.

He once boasted that he cured 9 out of 10 children who were called autistic by other clinicians without even giving them a diagnosis.

Kanner was a smart man, but many of his theories didn't work.

He classified autism as a form of infantile psychosis caused by cold, unloving parents.

These children, he said, were neatly stored in a refrigerator that never defrosted.

At the same time, however, Kanner noticed that some of his young patients had a special ability to focus on specific areas, such as music, math, or memory.

A boy in his clinic was able to distinguish 18 symphonies before the age of two.

When his mother put on his favorite record, he correctly said, "Beethoven!"

But Professor Kanner takes an ambivalent view of these abilities, arguing that children are just regurgitating what their pompous parents say, desperate for approval.

As a result, autism has become a source of shame and stigma for families, and two generations of children with autism have been institutionalized for their own benefit and hidden from the public eye.

Surprisingly, it wasn't until the 1970s that researchers began testing Kanner's theory that autism was rare.

Lorna Wing, a cognitive psychologist in London, told me she thought Kanner's refrigerator parenting theory was "absolutely stupid."

She and her husband, John, were warm and loving people and had a daughter, Susie, who had severe autism.

Lorna and John knew how difficult it would be to raise a child like Susie without support services, special education, and other resources that would be inaccessible without a diagnosis.

To argue with the National Health Service that more resources are needed for children with autism and their families, Lorna and her colleague Judith Gould decided to do what they should have done 30 years ago.

They conducted a study on the prevalence of autism in the general population.

They pounded the sidewalks of a London suburb called Camberwell, trying to find autistic children in the area.

What they saw revealed that while Kanner's model was too narrow, the reality of autism was much more colorful and diverse.

Some couldn't speak at all, while others raved about their interests in astrophysics, dinosaurs, and royal genealogies.

In other words, as Judith put it, these kids didn't fit in a neat box, and we saw far more of them than Kanner's monolithic model predicted.

At first, they struggled to make sense of the data.

Why has no one noticed these children until now?

But Lorna found a reference to a paper published in German in 1944, the year after Kanner's, then forgotten, buried in the ashes of a tragic time no one wanted to remember or think about.

Kanner was aware of the competing paper, but carefully avoided mentioning it in his book.

It was never even translated into English, but luckily Lorna's husband speaks German and translated it for Lorna.

The paper provided another story on autism.

Its author was a man named Hans Asperger, who in the 1930s ran a combined clinic and boarding school in Vienna.

Asperger's ideas about teaching children with learning differences were progressive even by modern standards.

Mornings at his clinic began with exercise classes set to music, and on Sunday afternoons the children put on a play.

Rather than blaming parents for autism, Asperger saw it as a lifelong polygenetic disorder requiring lifelong compassionate support and attention.

Rather than treating the children in the clinic like patients, Asperger called them little professors and enlisted their cooperation in developing educational methods specifically suited to them.

Importantly, Aspergers viewed autism as a diverse continuum spanning an amazing range of talents and disabilities.

He believed that autism and autistic traits were common and have always been, and saw aspects of this continuity in familiar archetypes in pop culture, such as the socially clumsy scientist and the absent-minded professor.

He even went so far as to say that a bit of autism is essential to success in science and art.

Lorna and Judith realize that Kanner was just as wrong about autism being rare as it was about being a parent.

Over the next few years, they secretly collaborated with the American Psychiatric Association to expand diagnostic criteria to reflect the diversity of what they called the "autism spectrum."

In the late 80's and early 1990's, their changes took effect, replacing Kanner's narrow model with Asperger's broad and comprehensive model.

These changes did not occur in isolation.

Coincidentally, when Lorna and Judith were working behind the scenes to reform standards, the world was seeing an adult with autism for the first time.

Until Rain Man's release in 1988, only a handful of veteran experts knew what autism looked like, but after Dustin Hoffman's unforgettable performance as Raymond Babbitt won four Academy Awards in Rain Man, pediatricians, psychologists, teachers, and parents around the world knew what autism looked like.

Coincidentally, around the same time, the first easy-to-use laboratory test for diagnosing autism was introduced.

You no longer need to connect with that small professional circle to get your child evaluated.

The combination of the "rain man", the changing standards, and the introduction of these tests created a network effect: the perfect storm of autism awareness.

As Lorna and Judith had predicted and hoped would happen, the number of diagnoses began to skyrocket, allowing people with autism and their families to finally get the support and services they deserve.

Then Andrew Wakefield came along, blaming vaccines for the surge in diagnoses, but the story was as false as Kanner's theory that autism was rare, a simple, powerful, and captivatingly believable story.

If the CDC's current estimate that 1 in 68 American children falls on the spectrum is correct, autism would be one of the largest minority groups in the world.

In recent years, people with autism have rallied online, rejecting the idea that they are the puzzle to be solved by the next medical breakthrough, coining the term "neurodiversity" to celebrate the diversity of human cognition.

One way to understand neurodiversity is to think in terms of the human operating system.

Because it's just a PC. Just because Windows isn't running doesn't mean it's broken.

By autistic standards, the normal human brain tends to be easily distracted, social, and lacks attention to detail.

Indeed, people with autism struggle to live in a world that wasn't made for them.

After 70 years, we are still catching up with Asperger's. Asperger believed that the "cure" for the most disturbing aspects of autism lay in understanding teachers, caring employers, supportive communities, and parents who believed in their children's potential.

As an autistic man named Zosia Sachs once said: "To rebuild the ship of humanity, we all need to work together."

As we sail into an uncertain future, all forms of human intelligence on Earth need to work together to meet the challenges we face as a society.

We can't afford to waste our brains.

thank you.

(applause)

somehow somehow somehow

blah blah blah, blah blah blah, blah blah blah

blah blah blah, blah blah

So what was it all about?

Well, you don't know because you don't understand.

it wasn't clear.

But hopefully it was at least told with sufficient certainty that it was fascinating and mysterious.

Clarity or Mystery?

In my day-to-day work as a graphic designer and in my daily life as a New Yorker, I try to balance these two things.

Here is an example.

Now, how many of you know what this is?

have understood. Now, how many of you know what this is?

have understood. Thanks to two more masterful strokes by the genius Charles M. Schultz, we now have seven masterful strokes that have created an entire emotional life in themselves and have captivated hundreds of millions of fans for over 50 years.

This is actually the cover of a book I designed about Schultz and his art, coming out this fall, and that's the whole cover.

There is no other printed or visual information on the cover, and the name of the book is "just what you need".

So this represents the decisions I have to make every day about the designs I am aware of and the designs I am creating.

Very clear.

Clarify your point.

Candid. Honest. It's sincere.

We ask ourselves: ["When should we clarify?"] Now, this sort of thing needs to be really, really clear whether we can read it or not.

Is it...?

This is a fairly recent example of urban clarity that I love. Mainly because I'm always late and always in a hurry.

So when this meter started showing up on street corners a few years ago, I was thrilled. I finally knew how many seconds I had to cross the road before I was hit by a car.

Six? I can do it (laughter) So let's look at the yin and the lucid yang. It's a mystery.

Mysteries are much more complicated by their very definition.

A mystery requires decipherment, and when it is deciphered right, we really want to decipher it.

["When should it be mysterious?"] During World War II, the Germans really, really wanted to crack this, but they couldn't.

Here's an example of a design I did recently for a Haruki Murakami novel that I've been working in design for over 20 years. This is a novel about a young man who has four close friends. After his freshman year of college, he is devastated when he is suddenly and completely insulated with no explanation.

And each friend's name has a Japanese meaning in each color.

There is Mr. Red, Mr. Blue, Mr. White, and Mr. Black.

Tsukuru Tazaki, his name does not correspond to any color, hence his nickname Colorless, but as he reflects on their friendship, he recalls that they were like the five fingers of a hand.

So I created this kind of abstract representation, but there's a lot more going on under the surface of the story, and a lot more going on under the surface of the jacket.

The 4 fingers become the 4 lines of the Tokyo subway, which is important in the story.

And the colorless metro line intersects with other colors. Basically, he does it later in the story.

He approached each one of these people to find out why they treated him that way.

Here is the 3D finished product sitting on my desk in my office. What I wanted here was simply to be fascinated by the mystery of what this looks like, and be tempted to read it and decipher it to find out why it looks the way it does, to make it clearer.

["The Visual Vernacular."] This is a way to use a more familiar kind of mystery.

What does this mean?

This is what it means. [“Make something look like something else.”] Visual language is the way we are used to applying one thing to another to see it in a different way.

This is the approach I wanted to take for David Sedaris's essay book of this title at the time. ["All the Beauty You Will Ever Need"] Now, the challenge here was that the title doesn't really mean anything.

It has nothing to do with the essays in this book.

The author's boyfriend appeared in a dream.

Thank you very much, so -- (laughter) -- usually I base my designs on some form of text, but this is the only text that exists.

With this cryptic title that really means nothing, I was trying to think. Where do you find that slightly cryptic text that looks like it means something but doesn't?

And sure enough, not long after that, after eating Chinese food one evening, this arrived. I thought, "Oh, binging, ideagasm!" (Laughter) I'm a fortune cookie.

This means that "few people know how much they can gain by ignoring the future."

thank you. (Laughter.) But we can apply this visual term to Mr. Sedaris, and we're so familiar with what a fortune cookie omikuji looks like that we don't even need cookie crumbs anymore.

We are witnessing this strange phenomenon and we know we love David Sedaris so we hope you have a great time.

["David Lakoff's 'Fraud' Essay"] David Lakoff was a brilliant writer, and magazines asked him to do things he couldn't do, which is why he named his first book Fraud.

So he was this skinny little city man, and GQ sent him whitewater rafting down the Colorado River to see if he could survive.

And he wrote about it, feeling that he was an impostor and that he was deceiving himself.

So I wanted the cover of this book to also pretend to be itself and somehow show the reader's reaction to it.

This inspired me to doodle.

I am fascinated by graffiti.

Anyone who lives in an urban environment will encounter graffiti all the time, and there are many different types of graffiti.

Here's a photo of just a transformer box on the sidewalk on the Lower East Side, but it's messed up tagged.

Now, whether you look at this and say, "Oh, this is a charming urban vibe," or look at this and say, "That's illegal property abuse," one thing we can all agree on is that you can't read this book.

right? There is no clear message here.

There is another kind of graffiti that I find much more interesting. It's what I call editorial graffiti.

This is a photo I took on the subway recently. Sometimes I see a lot of obscene and silly things, but I thought this was funny. Here's a poster saying la-la-la Airbnb, compiled by someone using a magic marker and what they think about it.

And that's what got my attention.

So I wondered how this could be applied to this book.

So I got hold of this guy's book, and when I started reading it, I thought, 'He's not who he says he is. he is a scammer

Then I took out a red magic marker and frustrated scribbled this on the front.

Your design is complete. (laughter) And they did it! (Laughs) The author liked it, the publisher liked it, and that's how this book came out. It was really fun to see people reading this on the subway and people walking around with this book. And they all seemed kind of insane.

(Laughter) ["The James Ellroy Novel Perfidia"] Well, James Ellroy, a great crime writer and a good friend. I have worked with him for many years.

He is perhaps best known as the author of 'The Black Dahlia' and 'L.A. Confidential'.

His latest novel was called This. It's a very cryptic name and I think a lot of people know what it means, but a lot of people don't.

This is the story of a Japanese-American detective investigating a murder in 1941 Los Angeles.

And then Pearl Harbor happened, and as if his life wasn't hard enough, now race relations really soured, then Japanese American internment camps were quickly created, and there's a lot of tension and horrifying events as he's still trying to solve this murder.

So, at first I thought about this very literally in terms of, okay, we're going to take Pearl Harbor and add it to Los Angeles and bring this apocalyptic dawn to the city's horizon.

And this is a photograph of Pearl Harbor grafted onto Los Angeles.

The editor-in-chief said, "It's interesting, but I think we can do better, and I think we can make it simpler."

And then, as I often do, I went back to the drawing board.

But also, being an eco-conscious person, I work in a high-rise building in Midtown, and every night before I leave my office, I have to press this button to get out, and the big heavy glass door opens to let me take the elevator.

Then one night, suddenly, I saw this and had a perspective that I had never noticed before.

Big red circle, dangerous.

And this is so obvious that I thought it must have been repeated a million times, so I did a Google image search and couldn't find any other book covers that were exactly like this one. And this is what really solves the problem, it's more interesting graphically, and creates a lot of tension between the idea of ​​some kind of sunrise over Los Angeles and America.

[A Tour of the Human Digestive System by "Gulp" Mary Roach. ] Mary Roach is a wonderful writer who takes mundane scientific subjects but is not at all mundane. She makes it really fun.

So in this particular case it will be about the human digestive system.

So I'm trying to decide what to do with the cover of this book.

This is a self-portrait. (Laughter) Every morning, I look at my tongue in the medicine cabinet mirror to see if it's blackened.

If not, it's okay to go.

(Laughter) I encourage you to do this too.

But I also started thinking that this was our introduction.

right? Enters the human digestive system.

But I think what we can all agree on is that real pictures of human mouths are offensive, at least based on this. (Laughter) So for the cover, I had this illustration drawn that is more palatable than the literal and reminds us that it's best to approach the digestive system from this end.

(Laughter) You don't even have to complete the sentence. have understood.

["Useless Mystery"] What happens when clarity and mystery are mixed?

And we see this all the time.

This is what I call a useless riddle.

I get on the subway -- I take the subway a lot -- and there's this piece of paper taped to the bridge.

right? And now I'm thinking, oh my train is coming soon so I'm trying to figure out what this means, thank you.

Part of the problem here is that they're compartmentalizing the information in a way that they find useful, but frankly I don't find it helpful at all.

So this is a mystery we don't need.

All you need is useful clarity, so I've redesigned this for fun.

It's all using the same elements.

(Applause.) Thank you. I'm still waiting for a call from the MTA. (Laughter.) You know, actually, I don't use more colors than they use.

I didn't even bother to make 4 and 5 green, you idiot. (Laughter) First you'll see the service change, then two complete sentences with a start, middle, and end to show you what's changed and what's going to happen.

call me crazy! (Laughs) [“A Useful Mystery”] Okay.

Well, here are some of my favorite mysteries. It's the packaging.

This Diet Coke can redesign by Turner Duckworth is a true work of art to me.

it's a work of art. beautiful.

But one of the things that's been so reassuring to me as a designer is that he's taken Diet Coke's visual language—the typeface, the colors, the silver background—and reduced them to their most essential parts. So it's like going back to Charlie Brown's face.

Not only does it provide enough information for them to understand what it is, but how do you get them to trust the knowledge they already have about this thing?

It looks great, and when you walk into a delicatessen and suddenly see it on the shelf, it looks great.

So the next thing - ["unhelpful clarity"] - is even more disappointing, at least for me.

So I'm back on the subway again. These are the pics I took after this came out.

Times Square Subway Station: Coca-Cola bought everything for advertising. have understood?

And maybe some of you know where this is going.

Ahem.

"You put your clothes on, cash in your pocket, eyes on the winnings and moved to New York.

You're drinking Coke." (Laughter) "You got your MBA, put on a nice suit, and moved to New York with a very firm handshake.

"I'm drinking Coke." (Laughs) This is the real deal! (Laughs) I couldn't even escape the support beam except for switching to Yoda mode. (Laughs) "I'm drinking Coke."

It was taken down almost immediately due to consumer backlash and all sorts of offensive parodies on the web -- (Laughter) -- and that dot next to "You're on" isn't a period, it's a trademark.

Thank you very much.

So, to me, this made me feel very strange how they were able to deliver such a mysteriously beautiful and perfect package and such an excruciatingly plainly wrong message.

It was incredible for me.

So I am happy to share with you some of my insights on how I use clarity and mystique in my work. I would also love to talk to you about how perhaps you decide to be more lucid in your life, or a little more mysterious and less sharing.

(Laughter) And I hope, if there's only one thing I want to say to you from this story, it's this. blah blah blah blah [“Judge this, Chip Kidd”] blah blah blah. blah blah blah

blah blah

(applause)

Every group of girl friends has interesting people. People who come to you when you want to cry, people who tell you to cry when you have a hard day.

And this group was no exception.

Except this is a groundbreaking community of women who have come together to become first teammates, then friends, then family, in the unlikely location of a special operations battlefield.

The camaraderie and courage of these women was cemented not only by what they saw and did at the tip of the spear, but by the fact that they were at a time when women remained -- formally at least -- banned from ground warfare and America did not know they existed.

The story begins with the words of some of the most tried special operations leaders in the U.S. military: "We need women to run this war."

"America will never die until the war is over," he said.

“It required more knowledge and more understanding.”

And as we all know, if you want to understand what's going on in your community or home, talk to a woman, whether you're talking about Southern Afghanistan or Southern California.

But in this case, in conservative and traditional societies like Afghanistan, men were not allowed to talk to women because that could lead to serious crimes.

That's why we needed female soldiers.

That meant that at this point in the war, women drafted to serve with Army Rangers and Navy SEALs would see combat like less than 5 percent of the entire U.S. military.

less than 5 percent.

Then the phone hung up.

“Women soldiers, be a part of history.

Take part in special operations on the battlefields of Afghanistan. ”

This was in 2011.

And from Alabama to Alaska, groups of women who have always wanted to join the best in doing what matters and make a difference in their country have responded to the call to serve.

And for them, it wasn't about politics, it was about serving with a purpose.

And women who came to North Carolina to vie for positions on teams that put women on the front lines of special operations landed and quickly found a community like they had never seen before.

They were full of women who were as fierce, healthy and passionate about making a difference as they were.

They didn't have to apologize for who they were, they could, in fact, celebrate it.

And when they went there, they suddenly realized there were a lot of people like them.

One of them said, "It felt like I realized there were multiple giraffes in the zoo."

Among this outstanding team was Cathy, a young woman who achieved an ROTC cadet, a sorority sister, and a minor in women's studies all in one.

A West Point track and field athlete, Tristan always ran and marched without socks, and wore shoes whose smell proved it.

(Laughs) Amber, who looks like Heidi, always wanted to be an infantryman, but when she found out that women couldn't be an infantryman, she decided to become an intelligence officer.

She served in Bosnia and later assisted the FBI in cracking down on drug cartels in Pennsylvania.

And although Kate played football all four years in high school, she actually planned to drop out in her first year and join the glee club, but the boys told her girls couldn't play football, so she decided to stay for the little girls who followed.

For them, biology was part of their destiny, and as Cathy once said, "everything noble out of reach for a girl."

Yet here, not despite the fact that they were women, but because they were women, there was an opportunity to serve with the best in a mission of national importance.

In many ways, this women's team was like women everywhere.

They wear makeup and, in fact, bonded over eyeliner and eye pencil in the ladies' room.

They were also wearing bulletproof vests.

With 50 pounds of weight on their backs, they boarded a helicopter for surgery and came back to watch a movie called "Bridemaids."

(Laughter) They even wore something called Spanx. Because, as they soon realized, uniforms made for men were big where they should be small and small where they should be big.

So Ms. Lane, an Iraq War veteran (you can see her to my left), decided to order Spanx for her base on Amazon so her pants would fit better each night when she left for duty.

These women met via videoconference from various locations across Afghanistan to discuss what it's like to be one of the only women doing what they do.

They joked about what worked and what didn't, what they learned to do well, and what they needed to do better.

And they talked about some of the brightest moments of being a woman on the front lines of special operations. Among them was the Shewee, a tool that allows you to pee like a man, but it is said to have a meager 40 percent accuracy rate.

(Laughter) These women lived in 'and'.

They proved that a person can be both fierce and feminine.